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COVER STORY:

Practical Risk Management in Flight Training

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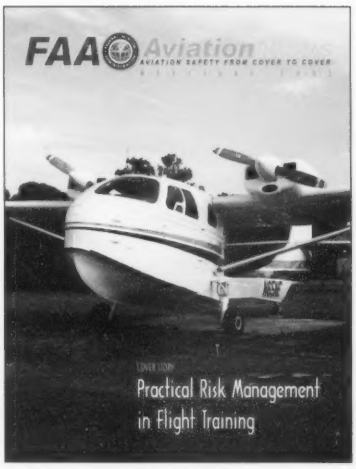


FRONT COVER: Seldom do you find such a good-looking seaplane at a flight school. This Twin Bee, *hull number 23, was photographed at Jack Brown's Seaplane Base in Winter Haven, Florida. (H. Dean Chamberlain photo)*

BACK COVER: The Super King Air *B200 in flight. (photo courtesy of the manufacturer)*

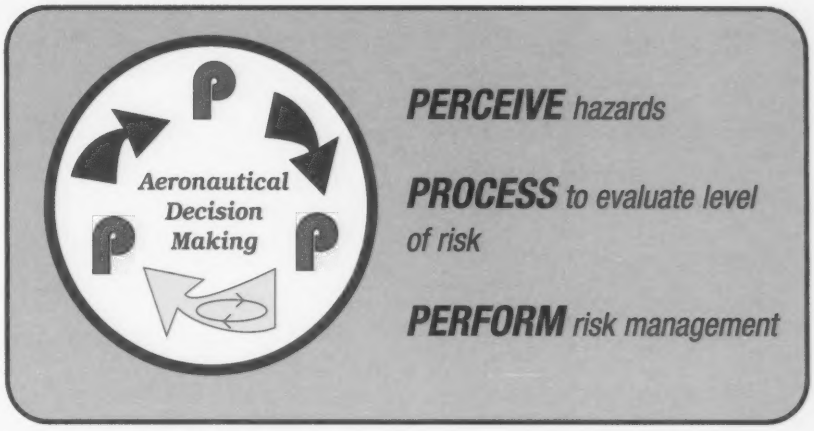
Practical Risk Management in Flight Training

by Susan Parson

There is a lot of talk these days about the need to incorporate risk management concepts and principles into flight training. Most flight instructors would agree that we should minimize the risk inherent in flying. But what does "safety" really mean? What exactly is "risk management?" How can a flight instructor not only ensure the safety of flight training, but also train clients in all stages of training to manage risk after they leave the relatively protected flight training environment?

As an active part-time flight instructor, a Civil Air Patrol instructor and check pilot, and (since May 2004) a full-time employee of the FAA's General Aviation and Commercial Division (AFS-800 in "FAA-speak"), I have been thinking a lot about these issues lately. One of the results of the ongoing process of thinking, talking, and testing practical risk management training materials is Volume 2 of the FAA's three new Flight Instructor Refresher Course developer's guide modules (available on the FAA web site at <http://faa.gov/avr/afs/fits/training.cfm > and also accessible through the Online Resources section at <http://www.faasafety.gov>). Volume 2 focuses on introducing the concepts of system safety and risk management as they appear in the formal literature on these topics.

More importantly, however, this document—which was developed by active flight instructors—seeks to offer a few practical tools for teaching your flight training clients to think, and practice, effective risk management in the real world. These tools start with the Perceive—Process—Perform model developed by the FAA's Aviation Safety Program.



I like to think of this 3P model as a mental equivalent to the physical flow pattern and scan techniques we teach for checking airplane configuration and instruments. In fact, the components of 3P model match up very well to the cross-check (perceive), interpretation (process), and control (perform) elements of the standard instrument scan. Just as in the case of an instrument scan, however, the 3P technique itself is pointless unless you know what to look for, how to interpret what you see, and how to apply that information to controlling the risk inherent in operating several thousand feet above Mother Earth.

Here's how the elements of the 3P scan are intended to work together:

- As you **perceive** (cross-check), the goal is to identify hazards, which are events, objects, or circumstances that could contribute to an undesired event. For example, a large nick in the propeller is a hazard.

- As you **process** (interpret), the goal is to determine whether the hazards you have identified constitute risk, which is the future impact of a hazard that is not controlled or eliminated. The degree of risk posed by a given hazard can be measured in terms of exposure (number of people or resources affected), severity (extent of possible loss), and probability (the likelihood that a hazard will cause a loss). For example, the hazard described above— a nick in the propeller—poses a risk only if the airplane is flown. If the airplane stays on the ground, there is no risk. If, however, the damaged prop is exposed to normal engine operation, there is a high risk that it could fracture and cause catastrophic damage not only to the airplane and its occupants, but also to people and property on the ground.

For those who like charts, the graphic on the next page provides a visual illustration of how measures of probability and severity come together to create different levels of risk.

RISK ASSESSMENT MATRIX				
	Severity			
Likelihood	Catastrophic	Critical	Marginal	Negligible
Frequent	HIGH			
Probable				
Occasional		SERIOUS		
Remote			MEDIUM	LOW
Improbable				

- In order to **perform** (control) by mitigating the risk identified in the perceive and process stages, you need to determine what you can do to maximize safety (i.e., freedom from those conditions (hazards) that can cause death, injury, or illness; or damage to equipment, property, or the environment). Since flight training is not possible without some level of risk, you also need to decide what constitutes an "acceptable" level of risk. In this connection, it is helpful to use the four basic rules of risk management:

1. *Accept no unnecessary risk.*
Unnecessary risk comes without a corresponding benefit. With a brand-new instrument student, for example, the risk of training in instrument meteorological conditions (IMC) may outweigh any benefit from the experience.

2. *Make risk decisions at the appropriate level.*
Risk decisions should be made by the person who can do something to reduce or eliminate the risk. Although you, as the instructor, retain final responsibility for the safety of the flight, remember that you are training clients to act as pilot-in-command. Asking them to identify hazards, assess risk, and suggest ways to mitigate the risk will instill good habits and help them develop judgment. Their answers to these questions will also give you valuable insights on the extent of the student's aeronautical decision-making skills.

3. *Accept risk when benefits outweigh costs (i.e., dangers).*
With an advanced instrument student, the benefits of training in IMC may outweigh the potential dangers, so long as there has been a careful risk assessment and implementation of appropriate risk controls.

4. *Integrate risk management into planning at all levels.*
Because risk is an unavoidable part of flying, safety requires the use of appropriate and effective risk management before every flight. As flight instructors, therefore, we need to help our clients develop the risk management skills they need to handle challenges that are not addressed by the rules or (more likely) beyond their experience.

Practical Risk Management Tools

So how can you incorporate the 3P risk management model into your training practices, and how can you help your clients develop the habit of a continuous risk management "scan?" There are many ways to approach this question, but here are two methods you might try out in both your flight training work and your own personal flying.

Ask Questions

At the quickest and most fundamental level, using the 3P method of practical risk management can be as simple as requiring your students to ask and answer a few basic questions before every flight. For example:

- To **perceive**, try to make a mental list of the hazards that can hurt you or others.

- To **process**, consider how likely it is that a given hazard will hurt you, and how bad the injury or damage would be.

- In order to **perform** risk management, ask yourself what you can do to reduce or eliminate each hazard or risk you have identified, and then implement the measures you have selected.

Use Checklists

For those (like me) who need or want a more structured approach to using the 3P model, here are three simple checklists that can be associated with each of the three components:

- To help students perceive

(cross-check) the hazards in all critical areas associated with a flight, you can encourage use of the PAVE checklist (available online at<http://www.faa.gov/avr/afs/FITS/pub_practices.cfm>) to identify hazards as well as establish personal minimums.

- To help students process (interpret) the possible impact and likelihood of each hazard identified through the PAVE checklist and begin to think about risk controls, you can suggest use of the CARE checklist:

- To help students perform (control) risk management, you can point to the TEAM checklist as a way of recalling the four major options for risk management and control:

- Putting it all together creates a continuous process much like the cross-check, interpretation, and control steps of the familiar instrument scan. See the illustration on page 4 for how it works:

Pilot	experience, recency, currency, physical/emotional condition
Aircraft	fuel reserves, experience in type, aircraft performance, aircraft equipment (e.g., avionics)
en***V***ironment	airport conditions, weather (VFR & IFR requirements), runways, lighting, terrain
External pressures	allowance for delays and diversions

Consequences	Think through the possible outcomes (consequences) posed by each of the hazards identified in the first phase, and determine (or "guess-timate") the level of risk involved
Alternatives	Develop a mental list of alternative courses of action
Reality	Acknowledge reality and avoid wishful thinking that might lead to poor decisions
External pressures	Be mindful of external pressures, especially tendencies toward "get-home-itis."

Transfer	Should this risk decision be transferred to someone else (e.g., should you consult an A&P mechanic?)
Eliminate	Is there a way to eliminate the hazard?
Accept	Do the benefits of accepting risk outweigh the dangers?
Mitigate	What can you do to mitigate the risk?

Real-World Risk Management

That's all great in theory, you say, but I fly and teach in the real world! Who has time for all this risk management rigmarole? In fact, using the 3P risk management cycle need not be a time-consuming chore. With practice and consistent use, running through the 3P cycle can become a habit that is as smooth, efficient, and automatic as a well-honed instrument scan. One way to implement these ideas is to include a 3P risk management discussion as a standard feature of your preflight briefing with the student or client. For example:

Perceive: Preflighting the *Pilot* should be the first step. Both you and your student should be healthy, well-rested, and alert. The next step is preflighting the *Aircraft*. Before you send your student out to the plane, though, help him or her think of the preflight process in terms of hazard identification (e.g., what could hurt me or people on the ground if I take off with less than the minimum quantity of oil?) A good weather briefing is part of identifying hazards related to the flight *enVironment*, and so is preflight planning for information on runway lengths, frequencies, and other factors. Last, but not least, teach your student to list any *External pressures* that might create a hazard. For example, is the client trying to fit a flight lesson into a busy day, with "can't miss" appointments scheduled after the lesson?

Process: To assess the level of

risk you face on a given flight, talk through the *Consequences* of each hazard you just identified. In the case of the pilot, for example, what should you do if your student or client rushes in looking harried, exhausted, and stressed out? If you charge ahead without first giving the person time to calm down, he/she will learn little from the aeronautical lesson, but may well learn the wrong lesson about risk management. As an *Alternative*, consider making it a ground training day, or use the simulator if it is appropriate to the student's stage of learning. Simulator sessions—even if only a "flight" on Microsoft® FlightSimulator—can teach students a lot about the impact (so to speak) of stress and fatigue on basic airplane control and aeronautical decision-making. Ensure that your students and clients acknowledge the *Reality* of each situation and hazard. One of my instructor friends reminds her students that any statement requiring use of the word "probably" needs another reality check. Finally, the number of accidents resulting from a "get there" mentality requires that you assess the potential influence of *External pressures*. For example, will tight scheduling of the aircraft induce you or your student to rush through the preflight and engine runup? A (young) student of mine once requested another instructor because I refused to do just that on his first lesson. I can only hope he remembers something from the fact that I actually practiced what I was preaching about priorities.

Perform: Let's assume that your primary student heads out to do some solo work in the local practice area. Shortly after takeoff, he/she discovers that the C-152's attitude indicator has tumbled, even though the vacuum pressure is well within normal limits. The weather is good and he/she knows that the altitude indicator is not required for day VFR flight. However, the student has not previously encountered such a problem, and recognizes the malfunction as a hazard that could lead to the risk of distraction or disorientation. The student's uncertainty also creates a degree of stress, which also raises the level of risk associated with this flight. What are the options for performing risk management? Since the CFI is legally the PIC for this flight, the student could seek to *Transfer* the decision by making a radio call for instructions. The second option is to *Eliminate* the risk inherent in continuing the flight by returning to the airport. Knowing that the attitude indicator is

1. **PERCEIVE** hazards using the **PAVE** checklist (Pilot, Aircraft, enVironment, External factors) What conditions might create risk?

2. **PROCESS** hazards by using the **CARE** (Consequences, Alternatives, Reality, External factors) checklist to help you evaluate the level and severity of risk.

3. **PERFORM** risk management by using the **TEAM** checklist (Transfer, Eliminate, Accept, Mitigate) to deal with each factor

not required, that the weather is good, and that he/she is supposed to be controlling the aircraft by outside visual references rather than instruments, the student might choose to *Accept* the risk and complete the practice session. There are several ways to *Mitigate* the risk; the most obvious is to cover the malfunctioning instrument to minimize its ability to distract or disorient the pilot. What would your student(s) do in this situation? What would you want them to do? There may not be a single "right" answer. The point is to teach your students and clients to recognize the hazards and options they will face in any given flight, and to equip them with the tools they need to evaluate their options in a logical and safety-conscious way.

It's All About Habits

It is never too early to start teaching your students about risk management. You may find that the 3P model is not all that different from what you have been doing all along. So why use it at all? Here are two reasons. First, I'm willing to bet that many of your flight training clients will have no idea what to do if you simply tell them they need to manage risk. The 3P model gives you a tool to teach them a structured, efficient, and systematic way to identify hazards, assess risk, and implement effective risk controls. Second, practicing risk management needs to be as automatic in GA flying as basic airplane control. Consider making the 3P discussion a standard feature of your preflight discussion. As is true for other flying skills, risk management thinking habits are best developed through repetition and consistent adherence to specific procedures. In the increasingly complex aviation system, we owe it to the pilots we train to equip them with the tools to practice this vital skill. ✢

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Susan Parson is a special assistant in Flight Standards Service's General Aviation and Commercial Division.

FAA's New GA Manager Envisions Lowering Accident Rate

story and photo by Mario Toscano

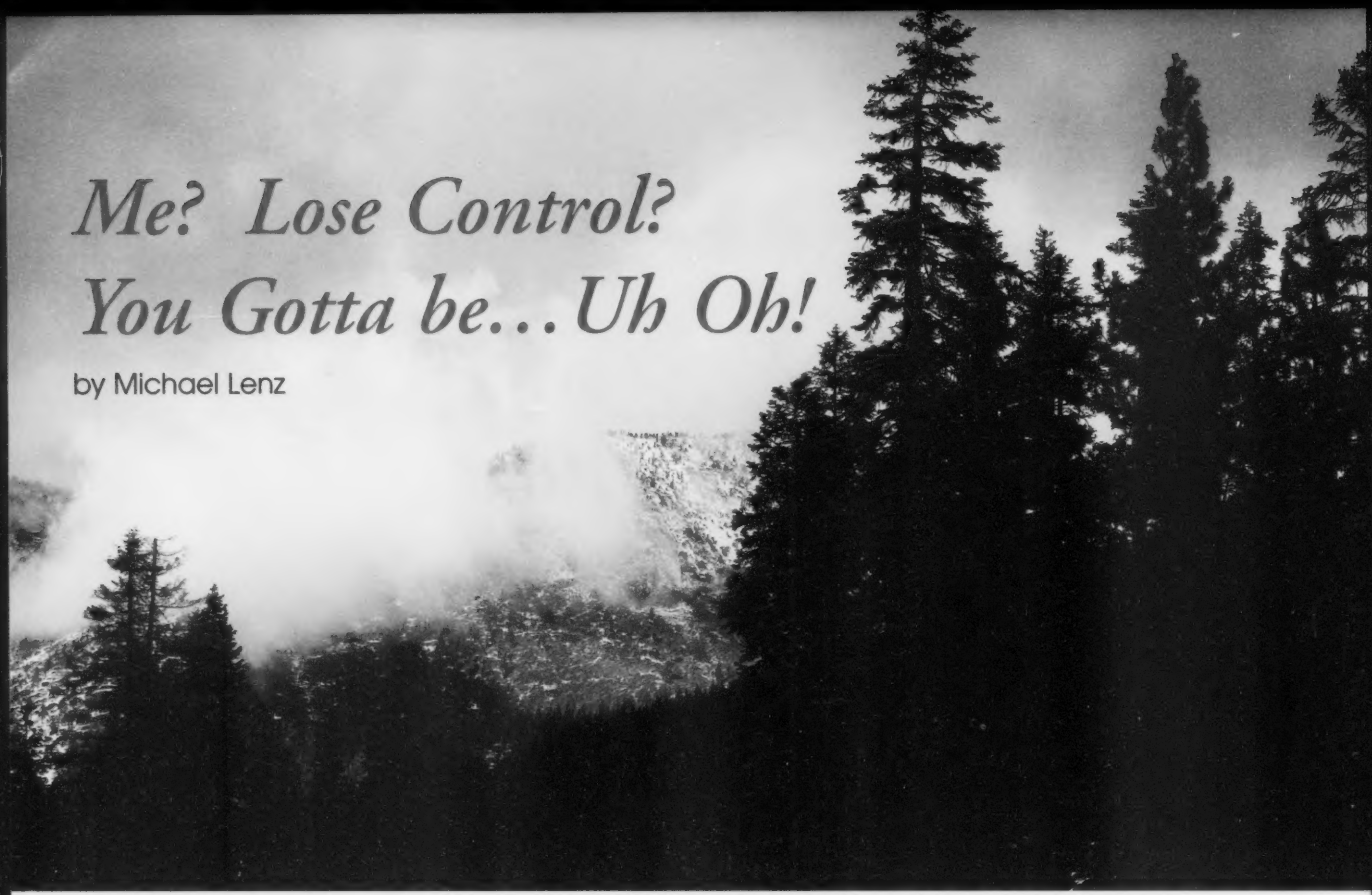
Peter Dula is the new manager of the General Aviation and Commercial Division in the FAA's Flight Standards Service. Dula assumed the new position April 2005, bringing into General Aviation over 30 years of wide-ranging aviation experience and a goal aimed to bringing down the General Aviation fatal accident rate. "My belief is that through training and standardization we can achieve that vision," he says.

Peter Dula's experience and aviation career is varied and extensive. He holds an air transport pilot rating with over 7,000 hours and is qualified in numerous military, transport category, and general aviation aircraft.

Dula received his "Wings of Gold" in 1979 by qualifying as a tactical strike carrier Navy pilot. As a pilot in the United States Navy, United States Customs Service, and the Federal Aviation Administration he has flown and worked in many parts of the world, including the Arctic, the Far East, the Middle East, North Africa, Asia, Europe, and Central and South America.

He joined the FAA in 1991 as an Aviation Safety Inspector at the Anchorage Flight Standards District Office (FSDO). During his 14-year FAA career he has held positions as a regional operations specialist, congressional liaison officer, and manager of Flight Standards District Offices in Texas and Arkansas.

In FAA headquarters, Dula was assistant division manager of the Flight Standards Service Technologies, and Procedures Division. Most recently, he served as an FAA executive in the Associate Administrator for Aviation Safety's Air Traffic Safety Oversight Service. That group is responsible for the development and maintenance of policy and requirements for the agency's Safety Management System that provides safety oversight of the FAA Air Traffic Organization.



Me? Lose Control? You Gotta be... Uh Oh!

by Michael Lenz

This is the second in a series of articles designed to provide general aviation pilots with a safe and practical approach to weather. The article is based upon an analysis of recent weather-related accidents and is promoted by the FAA Flight Standards Service's Safety Program, in coordination with the General Aviation Joint Steering Committee, which is comprised of government, industry, and aviation user organizations. This effort is focused on reducing general aviation fatal accidents.

Inexperienced pilots losing control of their aircraft in instrument meteorological conditions (IMC) still cause far too many accidents. While most pilots can tell a personal "and-there-I-was" story or two about being in the clouds, it's clear that pilots with the proper training and proficiency are far less likely to get themselves in a dangerous situation and, should they find themselves in such a situation, are more able to safely get themselves out of it. This article describes a few incidents where pilots quickly realized that they were in trouble, and several accidents that can provide important lessons to others. In all cases, better pilot training and proficiency might have prevented the problem or prevented it from worsening.

In the last *FAA Aviation News* article about weather accidents [see November/December 2004], the discussion revolved around accidents involving hitting terrain during a weather encounter in which pilots maintained control. These are better known as Controlled Flight into Terrain (CFIT) accidents. This article discusses the other situation in which pilots lost control.

When we think of a pilot blundering into weather, we think of a low-time VFR pilot who inadvertently enters instrument meteorological conditions (IMC). Unfortunately, there are plenty of these cases in the accident files. But not all of these encounters end in accidents. Sometimes a pilot can be fortunate enough to recover and find better weather. Here are a couple of examples of inflight weather encounters from the Aviation Safety Reporting System (ASRS). More reports can be found at <http://asrs.arc.nasa.gov/>. Select either Flash Version, the Non-Flash Version, or Get the Flash. Select "ASRS Database Report Sets." Under Report Sets Title, select "Inflight Weather Encounters.

"I lost sight of the ground."

I got a [weather] briefing...and departed in clear skies with unrestricted visibility.... I got within 10 miles of [destination airport] when things got worse and began to happen fast. I lost sight of the ground and descended to 1,000 feet MSL. I saw trees and antennas and decided to climb into the clouds and reverse direction. I got very disoriented and began losing control of the plane. I called approach control and asked for help. They vectored me back to VFR conditions. They did a great job keeping me calm, on course, and in level flight. They vectored me to an airport where I found a hole in the fog and landed safely. I was very shook up at what had happened because of my

poor decision not to turn back sooner. I felt like I was within seconds of losing my life.... I've heard and read stories of what can happen and how fast. To experience it was a valuable lesson....

"I am in the clouds and need help."

Conditions were getting worse by the minute...There were scattered thunderstorms throughout the area. This prompted me to hurry my preflight and departure. I was also trying to get to a meeting scheduled for later that afternoon.... I thought that if I could get about one mile from the end of the runway, I could make the determination of whether or not I would be able to make the flight home. If conditions were not favorable to continue, I would do a 90/270-degree turn back and land. Immediately after takeoff (1/2 mile and 300 feet), I was in the clouds. This was not what I had planned and fear and panic set in. Next came spatial disorientation. Unknowingly, I put the plane in a hard bank to the left and a very steep climb. Nothing was making sense to me and the next thing I remember was seeing...the VSI pegged off scale (greater than 2,000 foot per minute descent). I broke through the clouds long enough to see the ground coming up, which is a view I had never seen before and hope never to see again.... I thought of how stupid I was to get into this mess.... I pulled up hard. I remember doing this several times in the next few minutes of trying to stabilize the aircraft. The oscillations became less severe as I regained control of the aircraft.... My mind was not able to digest the tremendous amount of data it was receiving and I was trying to hang on by a thread.... My first [radio] transmission was, "[Approach] this is XXX and I am in trouble. I am in the clouds and need help. I need a vector to get out." [Approach] responded by giving me a squawk code and then a heading and altitude.... I was able to climb, but my heading was all over the place. [Approach] then said that I should be out of the clouds in about three or four miles. About 20 seconds later, I saw an opening to go down through the clouds and I took it.

As I look back, it was incredible how fast things went bad.... Why did I ever take off with conditions as bad as they were and getting worse? Why didn't I listen to any of the people I had talked with prior to takeoff that recommended not going? I truly believe in safety first, yet everything I did showed just the opposite.... I have learned a great deal from this event and I hope that those who choose to listen might learn from my story....

These accounts are very real. They're also gut wrenching and very different from the lessons we all remember in primary flight training in which the instructor said, "Okay, let's put the hood on and practice some simulated instrument flying." Things weren't nearly this hairy and frightening.

So, an instrument rating should fix all of this. Right? Well...maybe. It should greatly reduce a pilot's risk of losing control of an aircraft in IMC...and it does. Clearly, the knowledge and practical skills that are learned would make anyone a safer pilot. But there's a catch. It's called proficiency and experience.

Pilots have to practice instrument flying to stay proficient, and simulated instrument time under the hood is valuable, but it's not a substitute for the real thing.

In one accident, a recently IFR-rated pilot and owner of a new Mooney lost control of the aircraft shortly after departure from Savannah, Georgia, when returning home to Pennsylvania. The pilot's logbook showed proficiency flights to maintain the required IFR currency; some of these flights were even with instructor pilots. There was limited actual IMC time logged, however.

On the day of the accident, the pilot received a briefing from the Macon AFSS prior to departure. Upon departing Savannah, control of the aircraft was switched to Beaufort and the pilot was on an assigned heading and altitude to intercept the on-course airway. Although the flight was in solid IMC, there was no ice or convective activity that would have made control of the aircraft difficult. This was probably one of the pilot's first solid IMC flights. He had acquired his instrument rating seven months prior to this accident.

The aircraft was on an assigned heading of 050, and in less than two minutes, the aircraft made a left turn to 010 degrees and then an immediate right turn to 230 degrees and descended at a high rate of speed. The pilot and his wife were killed.

We can also look at a case of a pilot who had difficulty controlling the aircraft to maintain course and altitude while on an instrument landing system (ILS) approach.

The pilot was flying an A-36 Bonanza *from Columbia, South Carolina, to Atlantic City, New Jersey (ACY) and received fatal injuries when the aircraft struck terrain short of the runway. A review of Air Traffic Control (ATC) information revealed that the pilot attempted two ILS Approaches to Runway 13 at ACY. During the first approach, the controller made numerous attempts to assist the pilot in intercepting the localizer, by issuing vectors, and instructing him twice to climb, when he was below the glideslope. The controller also made numerous repeated transmissions to obtain pilot acknowledgment of navigational assistance instructions. At 1601, the controller stated, "November six papa romeo climb and maintain one thousand six hundred climb and maintain one thousand six hundred I show you about a mile from the outer marker you should cross the outer marker at one thousand six hundred." The pilot acknowledged the instructions; however, radar data indicated the airplane passed the outer marker at an altitude of 1,000 feet. At 1602, the controller asked the pilot if he had plenty of fuel on board and if he would like a surveillance approach to Runway 13. After vectoring the pilot back to the final approach course, the controller again asked the*

pilot if he would like a surveillance approach or if he would like to try the ILS approach again. The pilot responded, "Let's try the ILS 'cause I'm set up pretty much ready to go on it." The controller stated, "Okay, if you need the surveillance at all we're all set up and ready for it, ah, you can expect vectors for the ILS to Runway one three." For the following four minutes, the controller provided vectors to the pilot to join the ILS and made repeated attempts to assist the pilot in establishing the airplane on course. During the intercept, the pilot passed through the localizer and continued on an eastbound heading. The controller then elected to initiate a surveillance approach by providing vectors and instructed the pilot to contact the final approach controller. Four transmissions were necessary for the pilot to read back the correct final approach control frequency. The pilot contacted the final approach controller and received a step-down altitude and a heading. More instructions were given for the pilot to correct his heading. The controller cleared the pilot to land on Runway 13 and instructed the pilot to report when he had the runway in sight. The pilot responded, "... roger." This was the last transmission.

Interviews with family members and friends of the pilot, revealed he had received his instrument rating through a week-long school, within the past year, and had "not accumulated much instrument flight time" since then.

This brings up the question, "How do you safely acquire instrument experience?" One way is to fly in actual instrument conditions with an instructor or a proficient instrument pilot.

In his book *Weather Flying*[The McGraw-Hill Companies, 1998], Captain Robert Buck provides an excellent syllabus for a new instrument pilot to follow. Experienced pilots can use this for a guide to maintaining proficiency as well. Below are excerpts.

Teaching Yourself to Fly Weather

"Each day, in our advancing times, the complexities of air traffic control, routes, and communications grow, so that all the experience we can get in this area is important. If, on each flight, VFR or IFR, we are on a flight plan, doing all the work required, we will become facile with this part of the job and do it smoothly, almost automatically. Once this has become an easy task, we will have time to think about the weather.

[We can sneak up on flying actual weather by] flying a little at first, more as we gain experience.

Following is a step-by-step method. These steps are guides and one's own judgment will vary them as one appraises his or her growing ability and degree of comfort in different stages of weather.

The idea is to fly weather with safeguards that relate to our experience. After we've flown the first step's conditions enough to feel comfortable, we can take on a little more as in step two, and so on. The steps are:

1. Fly good weather to good weather on top.
2. Bad to good.

Step two is simply a continuation of the first step. When starting these

It can happen to the best of us:

I was stationed at McGuire AFB in 1958 and was flying C118 (DC6B) aircraft on passenger missions to Europe, Africa, Greenland, etc. On this trip I was the aircraft commander (PIC) and we had landed at Harmon AFB in Newfoundland for refueling, before launching off to Scotland with a full load of 70 passengers. The ceiling was less than 100' with 1/4-mile visibility. This was standard for this airport in the winter. After lifting off in the darkness I suddenly felt as if there was someone behind me pulling my seat back as if it was like a rocker. I felt the aircraft was extremely nose high and I pushed the nose down and allowed the airspeed to increase slightly from 152 knots to 165 knots. I then realized that my cross-check of the instruments was somewhat less than it should be. I checked the altimeter and rate-of-climb and determined instantly that I better raise the nose and maintain 152knots and increase climb. Suddenly all went to normal and the vertigo disappeared. The pilot in the other seat was a Squadron Check Pilot giving me a line check and he laughingly said, " had a little vertigo there?" Since that day many years ago I have scanned the instruments like a speed demon; and I always will whether I am on instruments or not.

(Walt Echwald has written numerous aviation articles and has over 68 years of flying experience. Walt presently owns and flies a Piper Twin Comanche.*)*

first steps, it's best to take off after a cold front has passed. Then there shouldn't be any more fronts for quite a long distance.

There are special situations, like the Los Angeles basin, that are excellent for bad-to-good flight experience. The frequent low stratus allows for an instrument departure and a climb to on top, where it's [clear], and then a flight to someplace on the desert like Palmdale where the weather is good.

3. Good to bad.
4. Bad en route.
5. Thunderstorms.

Looking back over these steps, we can see that weather flying experience isn't gained quickly. We need several seasons, years, to see the things we should see and experience. We must face the facts of weather flying. It cannot be gotten by injection, it cannot be gotten by reading a book, and it cannot be gotten quickly. We must remain humble for a long time and know when to quit or when not to go. An instrument rating is a beginning, not an endorsement that one can fly off in any weather."

Captain Buck goes on to describe each step in detail. It's well worth reading. You can also use this as a guide and develop your own proficiency plan in conjunction with your flight instructor, who knows your capabilities and those of your aircraft.

In recent discussions, Captain Buck wanted to reiterate some basics to readers. He said "We must emphasize the importance of doing one thing at a time. When a pilot gets into trouble, the first thing needed is to get the airplane under control and keep it under control; then handle the weather. Regarding weather, I don't believe we are getting in a pilot's mind what weather can do, that it is rarely static, but either improving or deteriorating. Pilots tend to look at weather reports, ceiling, etc., and, thinking the ceiling is high enough, charge out there VFR—never really realizing the chances for conditions to deteriorate—or get better, and what to watch for to see which way the weather is going. There are subtle things, such as realizing that a scud runner can suddenly be faced with near zero ceiling simply because the airplane approached even a small hill that lifted the air and orographically created low clouds that hugged the hill."

If we look back at recent accident statistics (since 1996), 116 instrument-rated pilots lost control of the aircraft in weather while on an IFR flight. Seventy-seven (77) of these pilots were operating in what should have been benign IMC conditions, in other words, no ice, severe turbulence or other factors that would have precluded an IFR pilot from maintaining safe aircraft control. In addition, 54 pilots lost control of the aircraft due only to light conditions, not weather.

If we look at loss of control accidents due to weather on other than IFR flight plans, there are another 218 fatal accidents since 1996. Seventy (70) of these pilots held instrument ratings. The high number of loss-of-control accidents, even when the pilot is IFR-rated, might initially seem surprising.

Why would an instrument rated pilot not be able to maintain control of the aircraft and reverse course while on a flight that is supposed to remain clear of all clouds in the first place? The illusionary effects happen quickly with the pilot's senses giving one indication while the aircraft instruments show something very different. When the inexperienced, low-proficiency or non-current pilot is suddenly immersed in a challenging environment, coupled with the daunting reality that their lives and their passengers' lives are at risk, mistakes can compound quickly. The bottom line is that all pilots should recognize that it can be challenging to fly in the clouds and that even if they are IFR-rated, they might not be fully prepared to fly safely.

Also, during an inadvertent IMC encounter, the instrument rated pilot now has to do something that no instrument training or previous experience prepared them to do...and that is to work their way out of clouds while the location of nearby terrain is uncertain and airspace and cloud clearance requirements are an issue. We'll never really know the details of VFR into IMC accidents, because these accidents usually occur to general aviation aircraft without cockpit voice recorders or flight data recorders. Most blunders into IMC that end successfully probably are not reported. ✢

Michael Lenz is a Program Analyst in Flight Standards Service's General Aviation and Commercial Division.

Administrator Hinson and Minister Chen at signing ceremony, FAA Headquarters, December 1994.

Cooperation with China Passes the 10-year Mark

by Jim Witeck

As with its predecessor, one of the four major goals in the most current Federal Aviation Administration's (FAA) Flight Plan 2005-2009 is International Leadership. A key initiative in this area is to "strengthen aviation safety oversight relationships and build strong, sustainable, mutually beneficial partnerships with key civil aviation organizations in Asia and Latin America." The following article focuses on one of FAA's most outstanding "successful stories" in this area, the now 10-year program of cooperation between FAA's Flight Standards Service and the General Administration of Civil Aviation of China's (CAAC) Flight Standards Department.

In 1993 China's civil aviation authority, the CAAC, reached out for help in a variety of areas to both the FAA and the Boeing Commercial Airplane Group, following a number of tragic aircraft accidents. The first tangible FAA response occurred in November 1994 when an FAA team headed by then FAA Administrator David Hinson and including then Flight Standards Service Director Tom Accardi visited CAAC headquarters in Beijing. In the formal "record of discussion" signed by Hinson and CAAC Minister Chen, FAA committed itself to a long-term cooperative relationship that would involve a three-phase program. The following month Minister Chen led a CAAC delegation that visited FAA headquarters where a more detailed Flight Standards work plan was agreed to and signed. This plan was to include the "development of CAAC operational and maintenance regulations, policies, and procedures as well

as activities to develop the regulatory oversight infrastructure to enhance an improve operational safety."

Actual cooperation work commenced the following year (1995) when a joint team of FAA and CAAC safety inspectors completed a comprehensive, three-week on-site review of the CAAC's then-current system of safety oversight and a joint report was ultimately published and widely disseminated that included more than 50 recommendations. These recommendations provided a "road map" for CAAC safety oversight improvement efforts over the ensuing years, efforts that have included more than 40 specific joint cooperative ventures with FAA Flight Standards involvement.

At the outset, senior FAA and CAAC Flight Standards managers executed an agreement to manage this program through the vehicle of a Joint FAA/CAAC Flight Standards Operations and Maintenance Safety Steering Group, a team that is comprised of the flight standards directors from both sides, along with a number of their senior division managers. This joint group first met in 1997 and has met on an annual basis ever since in order to exchange important safety oversight-related information and discuss and plan important cooperative projects to be undertaken during the following year. Results of these events are documented in formal meeting records that were signed by leaders of both sides.

FAA assistance efforts in the ensuing years, coordinated through the joint steering group, have taken many forms. Examples include presenting technical presentations and seminars in China, donating FAA technical courseware for inspector training, conducting inspector on-the-job training (OJT) experiences in FAA field offices, and sponsoring U.S. orientation visits on specific FAA oversight systems (e.g., Air Transportation Oversight System) or regulations, e.g., Title 14 Code of Federal Regulations (14 CFR) parts 135, 142, 147, etc. Virtually all of these experiences involve demonstrating FAA practices with CAAC subsequently adapting them to best fit China's operational context. Over a 10-year period, almost 50 specific technical exchanges of this nature have occurred.

The results of this close cooperation over the years has yielded great benefits in terms of the impressive accomplishments made by the CAAC Flight Standards Department in enhancing its safety oversight capabilities. Among the achievements—attributable at least in part to the FAA/CAAC collaboration—are the following:

- A much better and increasingly comprehensive set of regulations patterned after the federal aviation regulations, e.g., CCAR 121, 91, 63, 61, etc.
- Re-certification of all 23 Chinese airlines based on the new, enhanced CCAR 121 adopted in 1999.
- Oversight of the subsequent merger of these 23 airlines into four airlines.
- Establishment and continuing development of a CAAC Flight Standards Training Center (FSTC)
- Integration of both operations and maintenance oversight responsibilities within the CAAC Flight Standards Department
- Creation of a "third level of oversight," i.e., a network of 32 field offices to place additional inspectors in closer proximity to the entities they supervise
- Increased emphasis on important safety areas such as oversight of airline operational control and dispatch systems, i.e., an important area given the air service to the U.S. provided by four Chinese airlines.

As to the future, collaborative efforts will focus on important area such as a possible Maintenance Implementation Procedures (MIP) agreement, general aviation oversight (as development of the general aviation industry and its oversight is a high CAAC priority), safety data analysis, required navigation performance (RNP) implementation, cabin safety and dispatch inspector training, and aircraft evaluation group (AEG) organization and functions in light of the plans to produce a new regional jet in China. Given the strong foundation that has been laid and the excellent working and personal relationships that have formed over the years, it is likely that this cooperative program will continue to yield significant safety benefits, ones that will benefit the traveling public of both countries and the rest of the world.

Jim Witeck recently retired from FAA's International Programs and Policy Division in Flight Standards Service.

FAA's Safety Hotline

1-800-255-1111

FAA's Safety Hotline operates Monday through Friday (except holidays) from 8 am to 4 pm ET. It provides a nationwide, toll-free telephone service, intended primarily for those in the aviation community having specific knowledge of alleged violations of the federal aviation regulations. Callers' identities are held in confidence and protected from disclosure under the provisions of the Freedom of Information Act.

Preaching the Preflight Gospel
Preparing Your Passengers for That Next Flight

by Mike Brown

With a myriad of complex issues to be considered, most pilots begin each flight long before stepping into the cockpit. While tasks such as weather analysis, chart selection, and aircraft preflight are all important to safety, general aviation (GA) pilots often neglect another equally important responsibility. The preflight passenger briefing, in many cases a mere afterthought, should include more than simple anecdotal advice concerning airsickness or flight control interference. Maximizing passenger comfort and safety involves a careful review of the airplane, the environment in which it is to be operated, and most importantly, the needs of each passenger.

According to the Regs...

The infrequent nature of aviation accidents, coupled with a lack of regulatory guidance, are the two primary reasons many GA pilots neglect giving a comprehensive preflight passenger briefing. The only exception to the later may be found within Title 14 Code of Federal Regulations (CFR) section 91.107, which states in part...

"...No pilot may take off a U.S.-registered civil aircraft unless the pilot in command of that aircraft ensures that each person on board is briefed on how to fasten and unfasten that person's safety belt and, if installed, shoulder harness."

In addition, 14 CFR sections 91.517 and 91.519, which are applicable only to operators of large and turbine-powered multi-engine airplanes, mirror many of the regulations governing Part 121 and 135 air carriers. Collectively, they provide an introductory source of information relevant to preflight passenger briefings. Still, much within these regulations is extraneous to GA operations. In short, 14 CFR part 91 lacks the specificity necessary to address many of the situations likely to be encountered during normal flight operations.

One Possible Solution...

To counter this difficulty, pilots may wish to formulate a checklist or safety briefing card, similar to the example shown, to aid in completing their briefing more efficiently. For such a checklist to be of value, it must be thorough, easy to follow, and dynamic to the degree necessary to address the demands imposed by a typical flight.

Passenger Briefing Checklist

Ground:

1. Ramp Area (remain with pilot)
2. Aircraft Familiarization
   - A. Aircraft entry
   - B. Operation of aircraft doors and windows
   - C. Location and use of onboard fire extinguishers
   - D. Use of onboard oxygen systems (if applicable)
   - E. Use of seat belts and shoulder harnesses
   - F. Seat position and adjustment
   - G. Location of survival gear (first aid kit, life vests, etc.)
   - H. Location and use of heating and cooling vents

In Flight:

1. Access and use of flight controls
2. Crash positions (front and rear passengers)
   - A. Front- slide seat aft as practicable
   - B. Rear- move to rear facing seats as time and CG permit (as applicable). Brace for impact
   - C. Secure loose items

Post Flight:

1. Aircraft Egress (emergency)
   - A. Order and method of exit
   - B. Potential exit points (doors, windows, cargo hatches).
   - C. If and when to remain with aircraft
2. Aircraft Egress (normal)

To maximize the effectiveness of such a checklist, each item should be reviewed with the passengers prior to the flight, when time constraints and workload are at a minimum. This is also when passengers will feel the highest degree of comfort in voicing potential questions or concerns.

In the Final Analysis...

According to the most recent NTSB statistics, a GA accident occurs only once every 14,896 flying hours. This may be of little comfort to passengers, especially those with limited flying experience. Many pilots, not wishing to compound these fears, often avoid a comprehensive briefing in the belief that omitting the possibility of an accident will quell any misgivings. However, passengers realize that each flight brings with it an element of risk, however slight. Ignoring this possibility during a preflight briefing will only intensify their anxieties. On the other hand, a well-prepared passenger briefing will instill confidence in the pilot's professionalism and ensure that everyone enjoys the highest degree of comfort and safety before, during, and after each flight.

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Mike Brown is the manager of Flight Standards' General Aviation and Commercial Division's Certification Branch.

Yank and Bank vs Push and Manage

Automation and the Technologically Advanced Aircraft

by Scott D. Meacham

How many hours did you practice touch-and-go's before you felt comfortable? How many crosswind landings did you make before you felt at ease? How many hours did you spend studying or using simulator software getting acclimated with GPS or GNS? It would probably be safe to say that many of us answered "quite a few" to the first two questions and perhaps "very few" to the third. With the introduction of the new technically advanced single-pilot, single-engine aircraft and the retrofitting of the legacy models with fully integrated glass cockpits, new advanced training curriculums need to be available for the general aviator. Complimentary phrases such as, "He has good hands," or "She has good stick and rudder skills," may no longer apply. These phrases have been used for almost a century to describe the art of smoothly "yanking and banking" an aircraft. Yet it is not common parlance to hear complimentary phrases such as, "He has great push and management skills," or "She has great mode awareness and monitoring abilities." Not very snappy monikers like "Cap" or "Ace," but with today's ever-changing technology in General Aviation (GA), these skills have to be given their due.

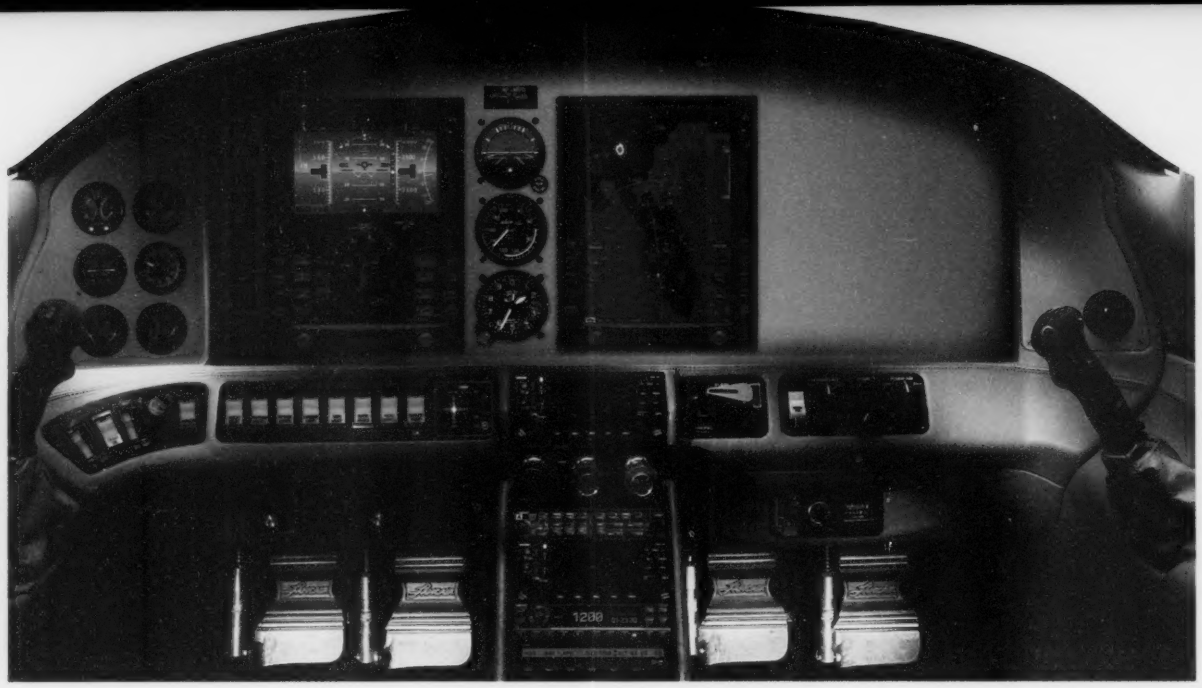
Dr. Stephen Casner from the NASA Ames Research Center writes the following in his published paper, "Learning About Cockpit Automation: From Piston Trainer to Jet Transport," "It appears that proficiency with cockpit automation is a separate set of skills to be acquired. Having extensive experience in airplanes not equipped with cockpit automation systems does not appear to be a substitute for explicit cockpit automation training. Working proficiently with advanced computer systems seems to be the result of training and experience working with advanced computer systems." In the past, arms and legs were the only tools used to manipulate or "yank and bank" the aircraft. Now we have options. Utilization of the autopilot in heading mode, nav mode (vor/loc) and vertical speed mode are just a few examples of the different types of tools available.

These are still just tools, and as in all jobs, there is an appropriate tool for the job at hand. As Dr. Casner points out, to use these tools proficiently requires training and experience.

The necessity to develop and utilize these automation and management tools has recently been addressed by the Federal Aviation Administration (FAA). Through the FAA Safer Skies initiative, the FAA has developed the FITS (FAA/Industry Training Standards) program. The FITS program is a partnership of FAA, industry, and the General Aviation Center of Excellence. The changes the technologically advanced aircraft (TAA) bring to General Aviation require a new approach to the way GA pilots are trained. With the cooperation of the aviation industry (manufacturers, insurance, training providers, etc.), the FITS-recommended curriculums are designed to meet the training challenges of these technically advanced aircraft.

One of the goals of FITS is to develop training curriculums that train pilots to utilize all available resources when operating the TAA. These resources could include: personal minimums checklist, accepted training programs, enhanced utilization of flight service stations for detailed weather briefing, improved flight planning techniques and utilization of air traffic controllers for briefings in an emergency. Many of these are available to the pilots and when used as a whole can greatly improve safety in their operations.

These ideas are not new to us as aviators, but, when used in conjunction with the modern cockpit, they may become a bit overwhelming for the pilot not trained in their use. As an example: A pilot flying a retrofitted legacy aircraft (i.e., C-172 *Skyhawk* with G-1000 integrated avionics), experiences electrical smoke while on a cross-country. Utilizing these resources, it would be appropriate to ask for a briefing from the air traffic controller that could include immediate vectors to an airfield, the ILS frequency, inbound course, initial approach altitude, and the missed approach altitude. The pilot would then be able to get back to the basics and direct all of his attention to flying the aircraft and landing safely. Consider the alternative: The pilot is trying to fly the aircraft, program the GPS, talk to air traffic control, program the navigation radios, read the Jeppesen® charts for the approach briefing, and safely land. It is doubtful that the second outcome will be as safely managed as the first. These techniques can be trained and practiced utilizing scenario-based training and good single-pilot resources management skills that are recommended through the FITS



program.

As flight school and manufacturers develop these training curriculums to reduce the risk and liability associated with the operation of these new types of airplanes, they could include many of the proven techniques used by regional, and major airlines. The FITS program has done an excellent job of incorporating these concepts into their curriculum models. For example, crew resource management and advanced qualification programming have certainly enhanced safety at the corporate, regional, and major airlines. These same types of programs are currently being developed for use with the TAA. Single-pilot resource management can be developed to teach pilots aeronautical decision-making, automation management, task management, situation awareness and avoidance of controlled flight into terrain. Training providers for new aircraft may also develop procedures for pilots to utilize a pre-flight risk-management checklist. Of course, a pilot must know his or her level of expertise and manage that accordingly; however, these checklists could be one more tool available to enhance safety and reduce risk. The evolution of this type of training in the TAA arena will be an arduous process. However, these additional tools will enable the pilot to manage an advanced cockpit with an increased level of safety and efficiency.

One other area of concern is the airspace in which these aircraft will be operating. As they begin to operate at higher altitudes and greater airspeeds, the necessity for pilots to "push and manage" is more critical. In essence, the pilot must operate his craft utilizing more management skills and fewer stick and rudder skills. However, "When do you use automation and when do you hand fly?" seems like a simple question. Perhaps, when the tool becomes a hindrance and nobody is minding the aircraft, the pilot should reduce the level of automation. This would allow less heads-down time and therefore more time to manage the whole aircraft, not just a piece of it. In any aviation operation, good situational awareness is paramount. The aviator must have the necessary training to know when to reduce levels of automation and get the back to the basics.

Pilots and operators go to great lengths to find the best maintenance and equipment for their aircraft. Shouldn't they do the same for their training? One must remember that just because you are good at "yanking and banking" with the old technology, does not ensure that you will be proficient at "pushing and managing" with the new technology: After all, "To err is human, to recover is good training."

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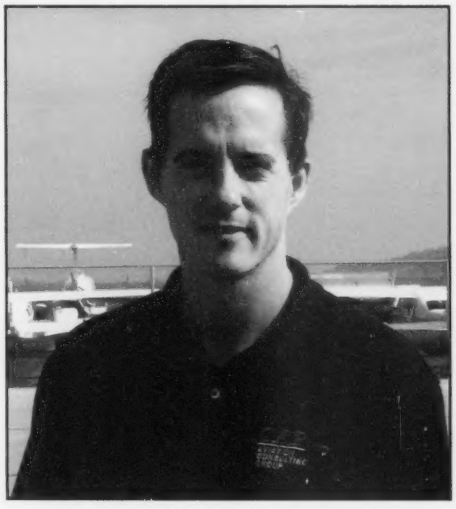
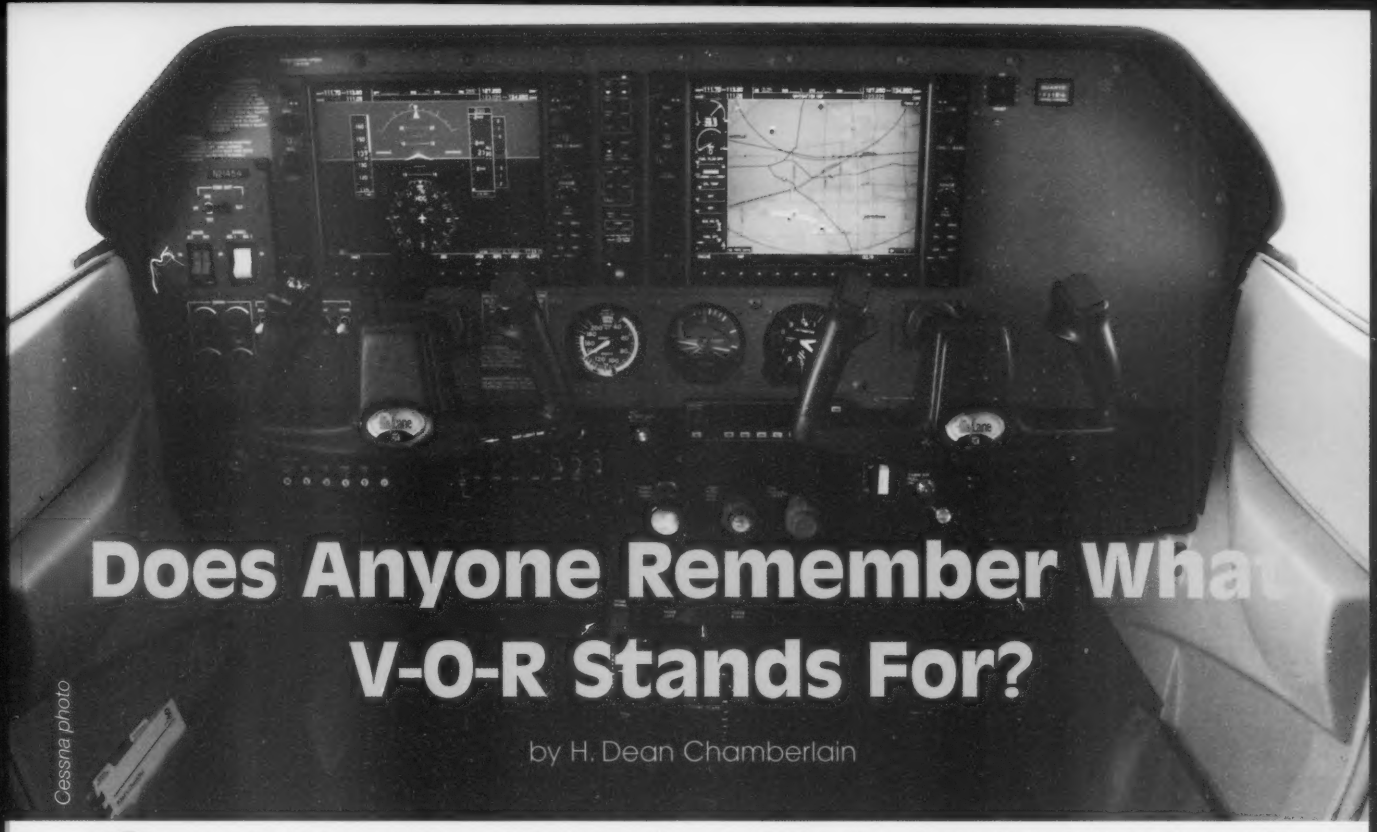


Scott D. Meacham specializes in Very Light Jet (VLJ) and Technologically Advanced Aircraft (TAA) curriculum development and auditing. He is Sr. VP of Auditing for the CAP Aviation Consulting Group. He holds ATP/Commercial/CFI certifications with type ratings in CL-65, E-120, SSF-340, and SA-227.



Does Anyone Remember What V-O-R Stands For?

by H. Dean Chamberlain

Cessna photo

One of the challenges I enjoy about the job I have is trying to find creative story ideas that meet an FAA safety objective while still being of interest to you, our readers. Sometimes, I wish I could publish new aircraft-type articles that are not only fun, but normally very colorful. New aircraft also make for great layouts. And like new babies, just about everyone in aviation likes a new aircraft. But, being an FAA safety publication, we try very hard to avoid commercial product discussions since we don't want to imply any type of commercial endorsement. Sometimes, we highlight new products because of their impact on aviation, such as the new very-light jets and the special operational and training issues the new jets pose and the proliferation of glass cockpits in today's smaller general aviation aircraft.

This article, I am sad to say lacks the colorful potential of a new jet or even a new, fast, piston-powered aircraft with its glass cockpit, but I think the topic is important and will become more important in the future. Simply put, does anyone remember what V-O-R stands for these days? Recently, I have been flying in several different aircraft and have been reviewing material for my first flight in a new Cessna 182 with the Garmin 1000® flat panel display. What makes all of this interesting or a challenge is that each of the aircraft had a different navigation system in it. Add in the training information for the new Garmin 1000®, and I hope you can start to see the training and safety issues involved. I miss the "good ole days" when a VOR was a VOR. If you knew how to turn one on, you could pretty much figure out how to operate it. The greatest challenge was remembering to properly identify the VOR site you were receiving to make sure it was functioning. But if you had seen one omni bearing selector dial, you had pretty much seen them all.

Even when area navigation (RNAV) came along and you could "move" a VOR electronically to another location within the appropriate transmission range to make it easier to use, VOR was still easy to use. Then along came newer navigation systems including the newest navigation system based upon satellites. That system, known in the United States as GPS, changed the way most of us now navigate. But in trying to master GPS have we forgotten how to navigate using the old VOR system? Does anyone still remember what V-O-R stands for?

I don't know how many recently certificated pilots know that a very high frequency omni range system can be abbreviated VOR, but as I was bouncing between aircraft recently, I realized that there is more to flying from point A to point B than hitting GPS Direct. I was amazed at how comfortable I had become looking at a moving map and going direct to a GPS waypoint or airport.

What brought this home was my attempt to do some VOR tracking and holding. I was in a Cessna 172 with a multi-function display (MFD) and a GPS unit different than the one I normally operate. The set up was also different than my own old aircraft. As I turned to intercept the VOR airway, I kept waiting for the needle in the course deviation indicator (CDI) to start drifting towards the center. It didn't. Now it had been a while since I did any VOR tracking, but I knew I

couldn't have forgotten how to track an airway. As I started reviewing how I had set up the VOR, and how I had identified the right station and its proper frequency, the proverbial light came on, pun intended. I realized the GPS/Nav switch still showed I was navigating on GPS. As soon as I switched to NAV, the CDI needle started to center and life was good. Although I was flying in good weather conditions, I wondered what such a simple error might have been like if I was departing in instrument conditions and had to depend upon the VOR immediately after takeoff. In reviewing the situation, I realized why I had missed the lighted switch. In my own aircraft, although the installation has the required switching unit, the GPS unit has its own dedicated CDI, and the VOR/ILS system has its own CDI. No switching is involved. The only switching needed is when I put the GPS on hold or to arm the approach mode. Plus, in the C-172 I was flying, the navigation mode indicator light was in a different location on the instrument panel than in my aircraft, which took it out of my normal scan.

Adding to my switching error was the fact that most GPS units operate differently. When you factor in all of the various opportunities to set up something wrong in today's aircraft, the learning curve becomes steeper as one bounces from one aircraft to another.

Then as I was watching my flight progress on the MFD as I flew from one intersection to another, every time I changed VOR frequencies my hand kept drifting to the GPS unit wanting to key in GPS Direct. Forget, entering a GPS flight route, I just wanted to hit GPS Direct, check the bearing and distance to the waypoint, and turn to that heading. But I knew if I did that, I would never keep proficient tracking VORs. The good thing is that the MFD allowed me to grade myself on my holding patterns and while tracking the airways.

I think one of the best things about using a GPS with moving map is how it helps you maintain situational awareness. As long as the GPS is working, you not only can see where you are, but in case of an emergency, it helps you identify and locate the nearest airport, VOR, or other waypoint you might need or want. Gone are the days when you had to mentally visualize your in-flight location based upon one or two navigation aids if you did not have distance-measuring equipment onboard. For those pilots who use to fly or maybe still do fly with one VOR, they are my heroes. Being able to select, identify, and track one VOR while doing crosschecks by tuning in another VOR must have been a challenge in instrument conditions. Add in a little turbulence and the workload must have been tremendous. Then when many aircraft came equipped with a second navigation system, life became much easier. Now with GPS and moving maps, life has become even easier. The recent addition of large, flat-panel displays with more information then the average pilot may ever want in your typical four-passenger family airplane has not only simplified flying, but it may have created its own unique challenge.

But now, according to some of the FAA's safety inspectors I have talked to, we have a more interesting challenge then just flying the airplane. The first is how to train rental pilots and those who fly more than one technically advanced aircraft how to safely operate the different GPS systems installed in those aircraft, and how they can maintain proficiency with all of the systems they may encounter when renting different airplanes. The second issue is what safety issues, if any, are involved when a new pilot who has only flown the new, technically advanced flat-panel equipped aircraft moves from that technically advanced aircraft back to an older aircraft with the traditional "steam gauges" and no moving map. The final question is what happens when the new systems fail. Will these technically advanced pilots be able to fly partial panel procedures instrument conditions with only three or four "old style" instruments?

Failure is a condition most pilots don't like to think about, but as one FAA aviation safety inspector asked recently while telling the story about when he was flying into New York's Kennedy airport and the approach radar failed, "Do you remember the required air traffic calls and procedures when you are no longer in radar contact?" He said most pilots have become so used to flying in a radar environment that when there is a radar failure, many pilots don't remember how to function in a non-radar environment.

If you are an instrument-rated pilot, other than when you took your instrument check ride, when was the last time you thought about the rules for a loss of communication situation in instrument conditions or the en route altitude rules?

If you add in the potential of flying in a full glass-cockpit when you have a total electrical failure, are you prepared to fly with your 30-minute backup battery while using your emergency steam gauge instruments? Such a situation gives new meaning to flying partial panel. Are you proficient enough to do it?

If you bounce from one type of aircraft to another, can you successfully fly the aircraft in instrument conditions while dealing with a serious system failure? If not, you may want to schedule some instructional time with your local certificated flight instructor once you ensure he or she is qualified, current, and proficient in the use of the aircraft and its avionics systems. If the instructor cannot explain how all of the avionics equipment operates including how to program and operate the GPS unit, you may want to find one who can. You may also want to check out the equipment manufacturer's Internet web site to see if the manufacturer offers a computer-based GPS simulator to practice using before the flight hour meter starts ticking. But learning how to operate the newest navigational systems and flat-panel displays in today's aircraft is only one of the challenges facing today's pilots.

The other challenge is can you still spell V-O-R if you have one onboard. Can you?

IMPORTANT IFR RULES AND REPORTING REQUIREMENTS

The following are some of the Title 14 Code of Federal Regulations (14 CFR) part 91 instrument flight rules and recommended reporting requirements instrument rated pilots and those leaning how to fly on instruments should know. Although most pilots routinely fly in areas with radar coverage and its minimal reporting requirements, there is always the chance of a radar outage or of flying in an area not covered by radar such as in mountainous terrain. As in any situation, if you have any doubt as to whether to report or not, you should ask air traffic control (ATC).

§ 91.183 IFR radio communications.

The pilot in command of each aircraft operated under IFR in controlled airspace shall have a continuous watch maintained on the appropriate frequency and shall report by radio as soon as possible—

(a) The time and altitude of passing each designated reporting point, or the reporting points specified by ATC, except that while the aircraft is under radar control, only the passing of those reporting points specifically requested by ATC need be reported;

(b) Any unforecast weather conditions encountered; and

(c) Any other information relating to the safety of flight.

§ 91.185 IFR operations: Two-way radio communications failure.

(a) *General.* Unless otherwise authorized by ATC, each pilot who has two-way radio communications failure when operating under IFR shall comply with the rules of this section.

(b) *VFR conditions.* If the failure occurs in VFR conditions, or if VFR conditions are encountered after the failure, each pilot shall continue the flight under VFR and land as soon as practicable.

(c) *IFR conditions.* If the failure occurs in IFR conditions, or if paragraph (b) of this section cannot be complied with, each pilot shall continue the flight according to the following:

(1) *Route.*

(i) By the route assigned in the last ATC clearance received;

(ii) If being radar vectored, by the direct route from the point of radio failure to the fix, route, or airway specified in the vector clearance;

(iii) In the absence of an assigned route, by the route that ATC has advised may be expected in a further clearance; or

(iv) In the absence of an assigned route or a route that ATC has advised may be expected in a further clearance, by the route filed in the flight plan.

(2) *Altitude.* At the highest of the following altitudes or flight levels for the route segment being flown:

(i) The altitude or flight level assigned in the last ATC clearance received;

(ii) The minimum altitude (converted, if appropriate, to minimum flight level as prescribed in §91.121(c)) for IFR operations; or

(iii) The altitude or flight level ATC has advised may be expected in a further clearance.

(3) *Leave clearance limit.*

(i) When the clearance limit is a fix from which an approach begins, commence

descent or descent and approach as close as possible to the expect-further-clearance time if one has been received, or if one has not been received, as close as possible to the estimated time of arrival as calculated from the filed or amended (with ATC) estimated time en route.

(ii) If the clearance limit is not a fix from which an approach begins, leave the clearance limit at the expect-further-clearance time if one has been received, or if none has been received, upon arrival over the clearance limit, and proceed to a fix from which an approach begins and commence descent or descent and approach as close as possible to the estimated time of arrival as calculated from the filed or amended (with ATC) estimated time en route.

§ 91.187 Operation under IFR in controlled airspace: Malfunction reports.

(a) The pilot in command of each aircraft operated in controlled airspace under IFR shall report as soon as practical to ATC any malfunctions of navigational, approach, or communication equipment occurring in flight.

(b) In each report required by paragraph (a) of this section, the pilot in command shall include the—

(1) Aircraft identification;

(2) Equipment affected;

(3) Degree to which the capability of the pilot to operate under IFR in the ATC system is impaired; and

(4) Nature and extent of assistance desired from ATC.

In addition to the aircraft regulatory reporting requirements of 14 CFR parts 71 and 91, the FAA's *Instrument Procedures Handbook*, FAA-H-8261-1, lists the following reports on page 3-19. According to the Handbook, "These reports should be made at all times without a specific ATC request." These reports apply in both a radar and nonradar environment.

(a) Leaving one assigned flight altitude or flight level for another

(b) VFR-on-top change in altitude

(c) Leaving any assigned holding fix or point

(d) Missed approach

(e) Unable to climb or descend at least 500 feet per minute

(f) TAS variation from filed speed of 5% or 10 knots, whichever is greater

(g) Time and altitude or flight level upon reaching a holding fix or clearance limit

(h) Loss of nav/comm capability (required by Part 91.187)

(i) Unforecast weather conditions or other information relating to the safety of flight (required by Part 91.183)

In addition to the above reports, the Handbook continues by saying, "When you are not in radar contact, these reports should be made without a specific request from ATC."

(a) Leaving a FAF or OM inbound on final approach

(b) Revised ETA of more than three minutes

(c) Position reporting at compulsory reporting points (required by Part 91.183)

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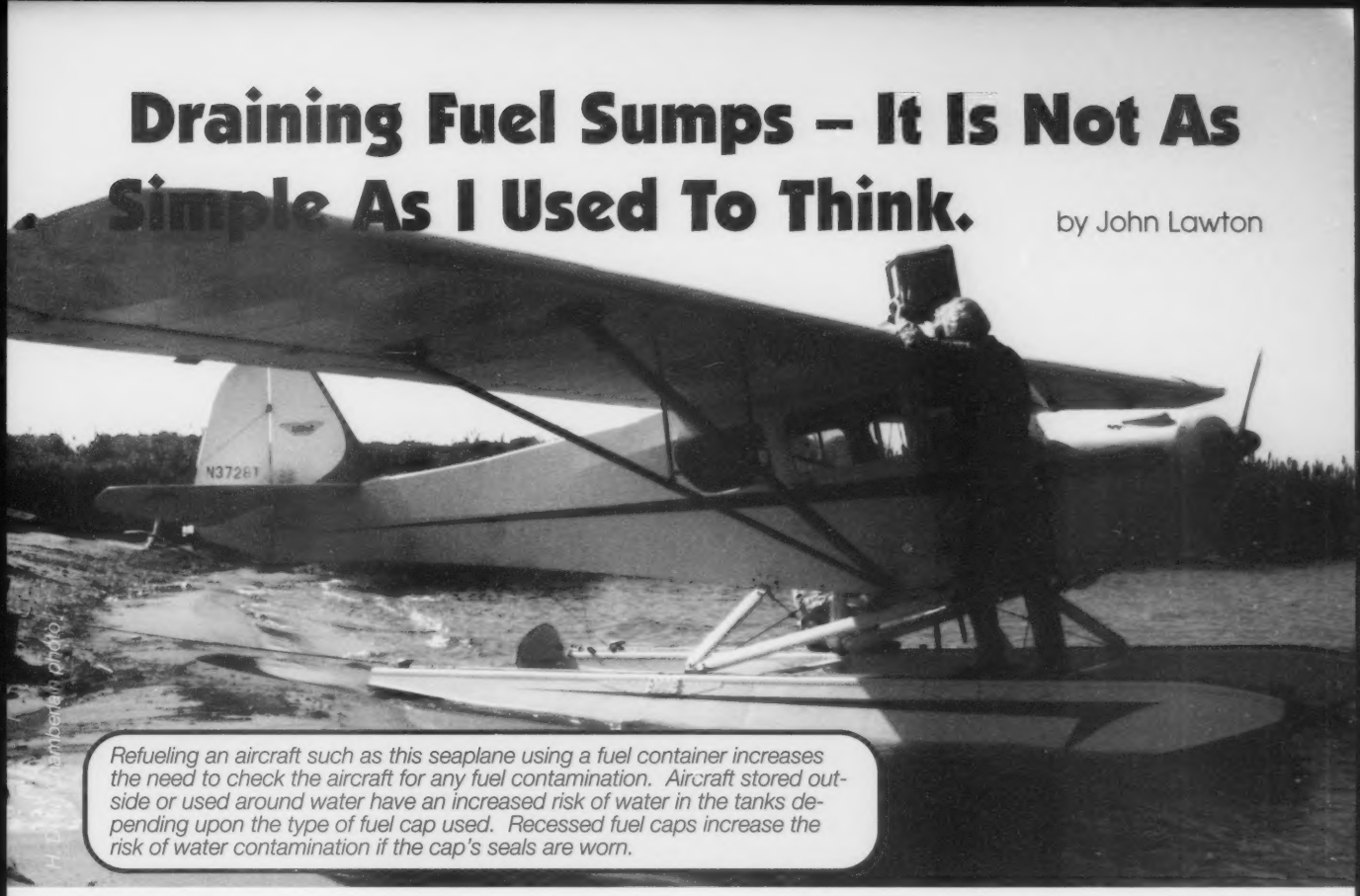
Draining Fuel Sumps – It Is Not As Simple As I Used To Think.

by John Lawton



Refueling an aircraft such as this seaplane using a fuel container increases the need to check the aircraft for any fuel contamination. Aircraft stored outside or used around water have an increased risk of water in the tanks depending upon the type of fuel cap used. Recessed fuel caps increase the risk of water contamination if the cap's seals are worn.

I still remember my first flight instructor, Bob, explaining the function of the gascolator on the Cessna 140 in which I took my primary training. Bob told me that it was located at the lowest point of the fuel system and since water is heavier (denser) than gasoline it would collect there. By draining from that low point into a transparent fuel sampler one could determine that the fuel was not contaminated. This seemed simple enough and I have done it thousands of times since. Bob also advised me to top off the tanks after each flight to reduce the amount of air in the tank because the air could contain water vapor, which could condense and form liquid water. Recently and literally by accident, I discovered that things don't quite work that way. Here is what happened:

The fuel sampler I used is made of a transparent plastic and has a plastic pin, which is pushed into a hole in the fuel drain or Curtis valve. That small pin broke off which left me with a usable fuel sampler, except that without the pin to keep it centered on the valve, it kept slipping off and I kept spilling gasoline onto my sleeve during the preflight. The airplane I was flying was an old Cessna 172E, which had been converted with a Robertson STOL kit, a 180 HP Lycoming engine, constant speed prop, auxiliary fuel tanks, etc. There are six fuel drains on this airplane, one for each of the four tanks, a belly drain, and the gascolator. So getting a little fuel onto my sleeve from each fuel valve made quite a mess; but I drained them carefully and found no water or other residue in any of them during my preflight. I flew an ice patrol to Buffalo, New York, for the U.S. Coast Guard that day. This took over four hours of flying time. After returning we put the airplane in its hangar without topping off the tanks. In the meantime, I made a metal pin to replace the plastic one that had broken off the fuel sampler. When I tried it out, I found both water and rusty contaminants in both aux tanks. There was no precipitation that day; and the dew point was below the ambient temperature, so where did the water come from and what about the contaminants? The explanation is very simple and now that I have thought about it, quite logical. Nevertheless, it never dawned on me until I got a rude awakening when I drained the tanks after the flight as well as during the preflight.

The explanation is as follows: The aux tanks on that airplane are located in the wing tips and because of the wing dihedral are higher than the main tanks. Each aux tank is plumbed into the main tank located further inboard and therefore lower in the same wing. There is a manually operated shut off valve in the line between these tanks, which must be kept closed until sufficient fuel has been used from the main tank. This stops the fuel from flowing into the aux tank causing the main tank to overflow. The engine is plumbed to the main tanks through a fuel selector valve. When the shut off valve between the aux and main tanks is open, fuel flows from the aux tank into the main tank until the aux tank is

nominally empty. During the mission both aux tanks had been drained of all usable fuel, but there was a little unusable and, as it turned out, contaminated fuel left, because the outlet from the aux tank is located higher than the sump drain valve. (I still had enough fuel in the mains for about another two hours of flying time at the end of the flight.) I tried my fuel sampler with the new metal pin on all six sumps. All the sumps, except the two-aux tanks that had been emptied of all usable fuel, checked out okay. A little water and some debris, which looked like rust, came out of the aux tanks. Repeated sumping of the aux tanks kept producing more debris. I started to pump the Curtis valves up and down in the hope that the resulting turbulence would dislodge more debris, which it did. Eventually only clean gasoline came out and then the tanks went completely dry.

So what is going on here? Well, if you have ever watched a washbasin or bathtub drain you may have noticed that dirt on the bottom of the tub does not start to move until the tub is nearly dry and that anything floating on top of the water will also not drain out until the tub is nearly empty. This observation should convince you that it is impossible to clean contaminants by draining a tank, which still contains a reasonable quantity of fuel. Undoubtedly what you do to clean the bathtub or washbasin is to leave the drain open and run some more water to flush the crud down the drain. That is essentially also what one needs to do to get the fuel tanks clean (Of course, one should flush the tanks with fuel instead of water.)

I wanted some experimental verification of this newly fashioned "theory." I took a plastic ice cream container about 6 inches in diameter by 4 inches deep and punched a hole about 1/8 inch diameter into the bottom from the outside. The inside diameter of the Curtis valve is about 1/8 inch. I filled it about half full with water and held my finger over the hole from the outside. Next I added some dirt from the garden. Most of the dirt sank to the bottom, but some organic material floated on top. When I removed my finger from the hole, clean water came out at first. When the depth of the water got down to less than one inch a vortex formed and some of the flotsam got sucked into the drain hole and clogged it. I cleaned it out several times and, as long as there was anything floating on top, it would clog the drain before any of the dirt on the bottom started to move. At no time did all of the dirt get washed out through that small hole.

Next I filled the container half full with gasoline and added a few drops of water. The water formed a "blob" at the bottom, which never drained out. I thought that this might be due to the slight ridge, which was formed when I punched the hole through the container from the outside. I punched another hole from the inside out. This time the blob did not get hung up and all of it drained out. I repeated this experiment several times and found that in order for the water to drain out the hole must be at the very lowest point in the fuel tank.

What can be learned from this?

Don't count on preflight sumping to clean water and "crud" out of the fuel tanks.

If you know that the fuel strainers in your tanks are higher than your sumps and your fuel system permits you to select the tank from which the engine is supplied, run the tanks dry one at a time and sump them after landing. (Don't try this on a Cessna 150/152 where both tanks feed the engine at the same time.)

Make sure that the tanks are thoroughly drained and flushed at every 100-hour and annual inspection. Have your mechanic remove the drain valve, drain the tank dry, flush it out several times with fuel in order to make sure that it is clean. Inspect the drain valves for contaminants, which can damage O-rings or keep the valve from closing properly.

This article originally appeared in the May 2004 issue of the EAA Chapter 846 newsletter's Technical Corner.

The importance of checking fuel for water contamination cannot be overemphasized. Equally important is understanding your aircraft's fuel system and making sure that all of the fuel drains are checked. As aircraft increase in complexity, so do the number and locations of the drains.

Dean Chamberlain photo

Flight Instructor Responsibilities For a Sport Pilot Proficiency Check

by Martin Weaver

FAA Flight Instructors certified under Title 14 Code of Federal Regulations (14 CFR) Part 61 subpart H or K now have added privileges to perform during a proficiency check for an additional category or class privilege at the sport pilot level. A proficiency check may also be accomplished for a flight instructor to provide training at the sport pilot level in additional category or class of light sport aircraft. Designated pilot examiners performing this function are doing so under their flight instructor privileges.

When would I need a proficiency check?

If you already hold a pilot certificate (other than a student pilot certificate) and want to add privileges to fly another category or class of aircraft. If you hold a flight instructor certificate and want to provide training in a different category or class of aircraft.

What does a proficiency check consist of for a sport pilot?

You must take a proficiency check from an authorized instructor other than the instructor who provided the training. This proficiency check covers the applicable aeronautical knowledge areas in section 61.309 and the areas of operation in section 61.311. The instructor conducting the proficiency check must use the guidance in the appropriate practical test standard to determine satisfactory performance.

What does a proficiency check consist of for a flight instructor?

You must take a proficiency check from an authorized instructor other than the instructor who trained me. This check covers section 61.409 flight proficiency. The instructor conducting the proficiency check must use the guidance in the appropriate practical test standard to determine satisfactory performance

As a flight instructor how do I accomplish this?

The proficiency check is outlined in the general introduction section for the sport pilot and the flight instructor section introduction for the sport pilot flight instructor of each Sport Pilot Practical Test Standard (PTS).

What do I have to do to pass the proficiency check?

Satisfactory performance of TASKs to add category/class privileges is based on the applicant's ability to safely:

1. perform the TASKs specified in the AREAS OF OPERATION for the certificate or privileges sought within the approved standards;
2. demonstrate mastery of the aircraft with the successful outcome of each TASK performed never seriously in doubt;
3. demonstrate satisfactory proficiency and competency within the approved standards;
4. demonstrate sound judgment in aeronautical decision making/risk management; and
5. demonstrate single-pilot competence.

Will I get a new certificate after passing the proficiency check?

No certificate issuance is re-

quired. However, when you satisfactorily complete the proficiency check, your instructor will endorse your logbook or flight record indicating that you are qualified to operate the additional category/class of light sport aircraft.

As the instructor who performs the proficiency check, what are my responsibilities after I provide the endorsement?

As the instructor performing the proficiency check you will ensure the Airman Certificate and/or Rating Application – Sport Pilot (FAA Form 8710-11) is filled out correctly on the front side of the form and is signed by the applicant. You will also ensure that the recommending instructor signs and prints his/her name on the backside of the form. Also on the backside of the form there is a "Proficiency Check – Instructors Record" block. You must check both blocks stating "I have personally reviewed this applicant's pilot logbook and/or training record and certify the individual meets the pertinent requirements of 14 CFR (Subparts K §61.419 or J §61.321) for the proficiency check sought." and "I have personally tested this applicant in accordance with the pertinent procedures and standards of 14 CFR Subparts K or J, and find the applicant proficient in _____ and _____ light sport aircraft." The blank spaces are to include the category/class of aircraft.

Mark the "Satisfactory" block then print and sign your name, certificate number, expiration date, and date of the proficiency check. You will then forward the form to Airman Registry within 10 days. The address is FAA Airmen Certification Branch, AFS-760, P.O. Box 25082, Oklahoma City, OK 73125-0082. This is the responsibility of the instructor who provides the endorsement. If the 8710.11 is not mailed in, there will be no FAA record that the proficiency check was done and the pilot is not eligible to exercise the pilot-in-command privileges of the category or class aircraft.

H. Dean Chamberlain photo

What is required if I do not pass the proficiency check?

When your performance does not meet the standards in the PTS, the instructor performing the proficiency check shall annotate the unsatisfactory performance on the FAA Form 8710-11 and forward it to Airman Registry within 10 days. You should be provided with a list of the AREAS OF OPERATION and the specific TASKs not meeting the standard, so that you may receive additional training.

When you receive the additional training in the AREAS OF OPERATION and the specific TASKs found deficient during the proficiency check, the recommending instructor will endorse your logbook indicating that you have received additional instruction and have been found competent to pass the proficiency check. You will then complete a new FAA Form 8710-11, and the recommending instructor will endorse your application. The authorized instructor, other than the one who provided the additional training, shall evaluate you. When you successfully accomplish a complete proficiency check, the authorized instructor shall forward the FAA Form 8710-11 to Airman Registry within 10 days and endorse your logbook indicating your additional category/class privileges.

All flight instructors should take the responsibility of performing proficiency checks very seriously. By performing this check you are stating that the applicant is safe to fly a different category of aircraft. This was normally a process that only a FAA Designated Pilot Examiner or FAA Inspector could perform. If, as a flight instructor you have any questions about this process, you should contact your Safety Program Manager in the local FSDO office or a Designated Pilot Examiner in your area.

Martin Weaver is the manager of Flight Standards Service's Light Sport Aviation Branch.

DoD photo by Airman Timothy Gunther, U.S. Navy

Mid-Atlantic Fly-In Holds Second Annual Fly-In

by H. Dean Chamberlain

Two U.S. Marine Corps AV-8B Harrier II *aircraft like these are scheduled to perform during the fly-in. Page 24 shows photos from last year's Mid-Atlantic fly-in.*

The Mid-Atlantic Fly-In & Sport Aviation Convention is holding its second annual gathering in Lumberton, North Carolina, May 12-15. According to one of its organizers, Dale Faux, last year's inaugural fly-in drew more than 50 thousand people and 539 aircraft. This year, he expects more people and from 1,000 to 1,200 aircraft to attend the event.

Located along North Carolina Interstate 95 (I-95) between Fayetteville and Florence, Lumberton Municipal (LBT) is a non-towered airport on the west side of the town. The airport is on the Charlotte sectional. The fly-in's web site listed on the next page provides a wealth of information about the fly-in and the local area, as well as camping, lodging, and other information that would be of interest to those planning on attending the event.

The web site also has a section explaining the procedures to be followed by arriving aircraft. As noted on the procedure, Runway 5/23 will be in use and they request that you advise which direction you will be arriving from when calling the advisory frequency. Runway 13/31 will be closed during the fly-in. The published fly-in advisory frequency is 134.3 MHz. Please note this frequency is to be used only from May 12-15. The charted CTAF frequency is 122.8 MHz. The arrival procedures also warn that there is no operating control tower. The arrival information is strictly advisory and that "You, as pilot in command, are responsible to obtain a complete preflight briefing including all NOTAMS; to remain VFR at all times, and to see and avoid all other traffic." Questions regarding arrival information should be directed via e-mail to <airbossinc@triad.rr.com>.

Ultralight traffic will be operating at 500 feet MSL and below east of the airport on a grass landing strip located near the approach end of Runway 31.

Pilots are reminded to operate VFR at all times.

The airport will be closed from 7:30 pm to 9:00 pm on Friday, May 13, for a limited, about 30 minutes, special sponsor air show. The airport will be closed from 1:30 pm to 4:15 pm on Saturday and Sunday for the regular air show. Although the fly-in's web site has a new air show page listing the scheduled performances, a few of the featured acts include The Aeroshell Team as well as an F-16 and C-17 military fly-by. Of special interest for many will be the gravity defying

hover demonstration of the Marine Corps AV-8B *Harrier* aircraft that has amazed and thrilled thousands of people at air shows across the country.

The FAA will have an exhibition area at the fly-in with additional support provided by the Charlotte and Greensboro Flight Standards District Offices. The National FAA Safety Team exhibit and the FAA's Southern Region Runway Safety exhibit will be part of the FAA display. The FAA exhibit area will be open from 9 am to 4 pm.

Six FAA forum presentations are planned for the fly-in. Two forums will be held each day, one at 8:00 am and one at 9:30 am during the fly-in. Subjects include Human Factors, Preventive Maintenance, Sport Pilot, and Temporary Flight Restrictions. Anyone interested in the forums should check with the FAA at its exhibition area for the latest update.

A Pre-Flight Contest featuring a Preceptor *Pup* which was donated by the Haston Brothers to the Southern Aviation Safety Foundation will challenge contestants preflight skills in support of the FAA's safety mission. The *Pup*, which resembles a Piper J3 *Cub*, will have predetermined "defects" such as incomplete paperwork or various airworthiness issues that a pilot should be able to find during a normal preflight. Contestants will be judged on the number of "airworthiness defects" found. Stop by the exhibit and ask Harley Pickett for a write-up sheet to begin.

The North Carolina Department of Transportation will also have an exhibit.

Described by some people as a new, grass-roots, family-type of fly-in, supporters of the Mid-Atlantic Fly-In say they expect the annual event to grow into one of the largest fly-ins in the mid-Atlantic region of the country. The fly-in will feature fun, food, forums, and workshops in addition to the scheduled air show.

For those driving to the fly-in, North Carolina I-95 exits 14 and 17 can be used to drive to the airport. Drivers can follow the red arrows to auto parking and the main admissions entrance. The Airport Boulevard Entrance is restricted to specific vehicles such as exhibitors, campers, emergency vehicles, and special permit vehicles.

The Mid-Atlantic Fly-In's Internet web site is <www.midatlanticflyin.com>.

+

photos provided by Dale Faux

Play it safe when flying with your child.

Parents go to great lengths to keep children safe at home and on the road. But what about in the air? When you're traveling by airplane, an approved child restraint system (CRS) is the only way to make sure your little one will be safe in the event of turbulence or an emergency.

Turbulence is air movement that normally cannot be seen and often occurs unexpectedly. It can be created by many different conditions, including atmospheric pressure, jet streams, air around mountains, cold or warm weather fronts or thunderstorms. Turbulence can even occur when the sky appears to be clear.

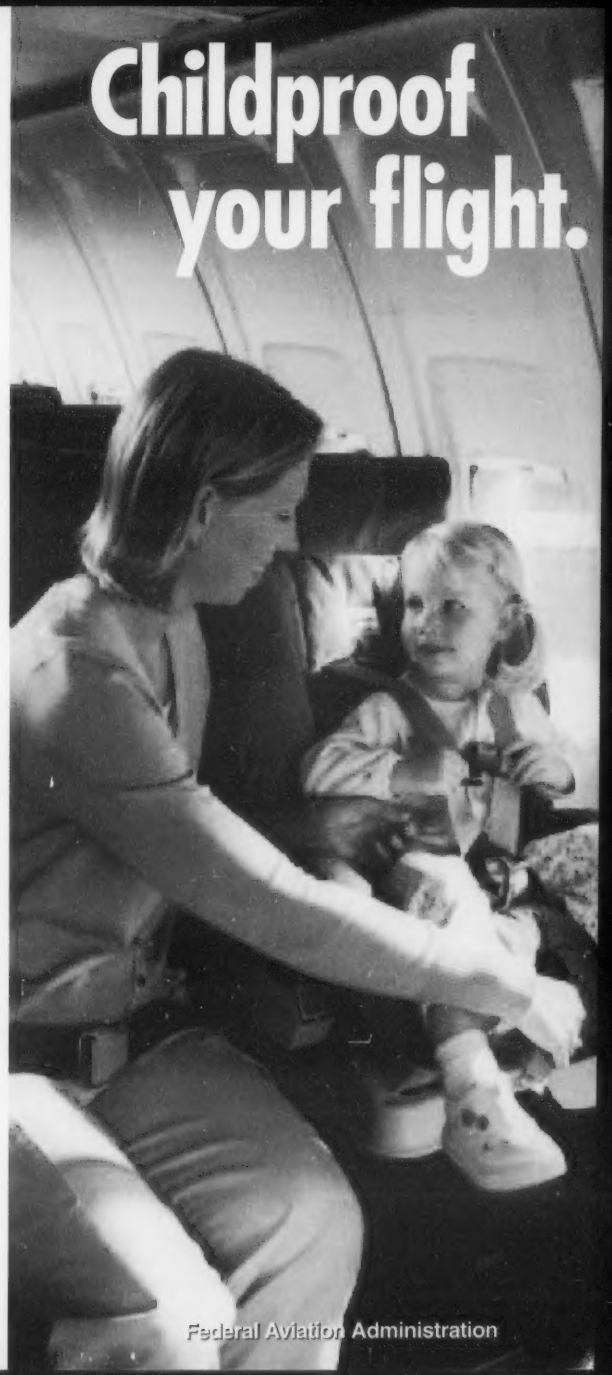
The Federal Aviation Administration (FAA) strongly urges you to secure your child in an appropriate restraint based on weight and size. Turbulence can happen with little or no warning. And when it does, **the safest place for your child is in a CRS, not in an adult's lap**. Your arms just aren't capable of holding your child securely, especially when turbulence is unexpected. Keeping your child in a CRS for the duration of the flight is the smart and right thing to do so that everyone in your family arrives safely at your destination.

TURBULENCE happens.

U.S. Department of Transportation

Federal Aviation Administration
www.faa.gov

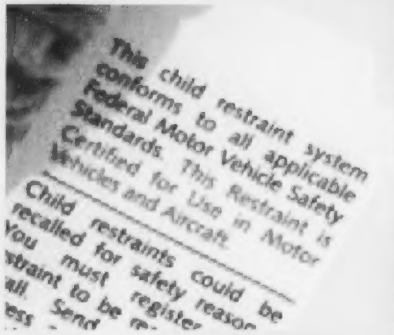
Childproof your flight.



Federal Aviation Administration

Make sure you're cleared for take-off.

- ✓ Make sure your CRS is government approved and has "This restraint is certified for use in motor vehicles and aircraft" printed on it. Otherwise, you may be asked to check the CRS as baggage.
- ✓ Measure the width of your CRS. It should fit in most airplane seats if it is no wider than 16 inches.
- ✓ Ask your airline for a discounted fare. Many airlines now offer discounts of up to 50 percent for children less than two years of age. Purchasing a ticket for your child is the only way to guarantee that you will be able to use a CRS.
- ✓ Reserve adjoining seats. A CRS must be placed in a window seat so it will not block the escape path in an emergency. A CRS may not be placed in an exit row.
- ✓ If you do not purchase a ticket for your child, ask if your airline will allow you to use an empty seat. If your airline's policy allows this, avoid the busiest days and times to increase the likelihood of finding an empty seat next to you.


This child restraint system conforms to all applicable Federal Motor Vehicle Safety Standards. This Restraint is Certified for Use in Motor Vehicles and Aircraft.
Child restraints could be recalled for safety reasons
You must register
straint to be re-
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ess

- ✓ Ask your airline if they can provide a CRS for your child. If so, you may not be permitted to bring your own CRS on board and may need to check it as baggage.
- ✓ Arrange for your airline to assist you if you need help making a connecting flight. Carrying a CRS, a child and luggage through a busy airport can be challenging.
- ✓ Pack a bag of toys and snacks to keep your child occupied during the flight.
- ✓ And, of course, always use a CRS in your vehicle when driving to and from the airport—or anywhere!

Keep your little one safe when you're in the air.

Always follow the manufacturer's instructions for using a CRS. Be sure that the shoulder straps are properly adjusted and fasten the airplane seat belt around the CRS as tightly as possible.

Do not place a child in a CRS designed for a smaller or larger child than indicated in the manufacturer's instructions. The FAA recommends that a child weighing:

- Less than 20 pounds use a rear-facing CRS.
- From 20 to 40 pounds use a forward-facing CRS.
- More than 40 pounds use an airplane seat belt.

While booster seats and harness vests enhance safety in vehicles, the FAA prohibits passengers from bringing these types of devices on airplanes for use during taxi, take-off and landing. They should be checked as baggage. Also, supplemental lap restraints or "belly belts" are banned for use in both airplanes and vehicles in the United States.

It's a good idea to bring this brochure with you when you travel. For more information, visit **www.faa.gov**. And remember that adults should wear their seat belts at all times while on board, too, because *turbulence happens*!

Tales from an FAA Inspector

by Al Peyus

Temporary Flight Restricted Areas
Where are they and how do I get the information?

The ground hog got it correct! We have had six plus more weeks of winter! It has turned out to include six more weeks of ice, snow, heavy rains, high winds, and low ceilings. Even the birds have had to sit it out more with the unusual weather this year! Spring is now ready to enter our lives! Are we ready for it?

During this down time, Temporary Flight Restriction (TFR) areas have been receiving a lot of attention. Because of a wide variety of reasons, TFR's have been the focus of far too many "Unintentional TFR air space penetration" investigations. Many of these occurred because the pilot trusted the Global Positioning System (GPS) installed in the aircraft. Some of the investigations were because the pilot was not aware of the TFR or its location. Can you identify the TFR's with their air space limitations located near your normal flying area?

There is a wide variety of ways and means for us to keep up to date with the National Airspace System and those constant and changeable TFR's. But before we can start digging for the various TFR's, their locations and limitations, we must understand what can produce a TFR. There are a wide variety of issues and reasons that impose temporary flight restrictions over a particular area.

There are the obvious air space controls imposed for Presidential protection, such as P-40. When Camp David is occupied, P-40 grows in all directions. The expansion is NOT shown on sectional charts but is discussed at length in Notices to Airmen (NOTAM)! Every time the President flies in Air Force One, there is a large block of moving air space that protects Air Force One. Because of September 11, 2001, restrictions, the area around Washington, DC, is now protected with a permanent TFR called a Flight Restricted Zone (FRZ).

Are there additional TFR protected air space beyond those that provide protected air space around the President and Vice-President? The answer is as simple and complex as the question itself. Of course there are! That's the simple part. Allow me to try to explain some of the complex parts of the answer and give you examples of each.

Every nuclear power plant has protected air space. The air space protected covers three statute miles (sm) in diameter from the center of the plant and up to 2,000 feet Above Ground Level (AGL). Every major league and college division one sports event has a TFR protecting it. The size and altitude of that protection can vary, but is generally three sm out and 2,000 feet AGL.

In the western mountainous areas, the fire season produces many TFR's. These are designed to keep civilian pilots from finding themselves face-to-face with a borate bomber or one of the spotting aircraft. When an earthquake shakes the United States, that area is covered with a TFR to allow rescue, supply, and government assistance to proceed without interruption. In the heartland of the United States from Minnesota to Texas during an active tornado season, a wide swath of TFR's can limit travel in this area. This is again for rescue, aid, and government oversight. Up and down the Mississippi and Ohio rivers, there have been TFR's issued to protect the rescue and aid supplied to those caught in massive floods.

It does not have to be presidential protection, national security, or natural disasters that bring protected TFR air space out for us to avoid. Air shows and air races also have TFR protected air space around them. NASCAR, for the big events (30,000 people and larger), have air space protection. There are almost as many reasons for a TFR as there are TFR's.

None of us deliberately want to penetrate a TFR. That begs the next question. How do we plan a flight in our local area or a cross-country through air space we have not flown before, and assure ourselves that all will go well on our flight? Here in is the major problem facing us, the civilian pilots.

We were taught from the very first flight lesson to always contact a Flight Service Station (FSS), or the newer Automated Flight Service Station (AFSS), for a weather and NOTAM briefing. During this briefing we receive all the weather information we need to make the decisions necessary for a safe flight or not to fly at all. This information gives us the information to decide the route to fly, altitude, and alternate airport planning if needed.

During the NOTAM briefing, we listen closely to all that is being said by the briefer. Because of the way the AFSS/FSS system is designed, the NOTAM information may be buried in the large amount of data provided us. If we are following along marking a sectional, we have made our own pictorial map of the airspace! If not, then we are left guessing the exact area the controller was discussing.

Is the AFSS/FSS the only place to get information on TFR's? The obvious answer to this question is, No! The FAA does a good job of getting information out to the public.

On the FAA's web site home page, <www.faa.gov>, scan over to the right side of the page under " Quick Finds." Scroll down to and click on "Pilots: NOTAMS." The next page is titled "Welcome to PilotWeb" with a current date and time (ZULU). The first box with selections available is titled "NOTAMs." This includes Safety NOTAMs, Center NOTAMs, Radius Search, Flight Path Search, Graphic TFRs, Published Notices to Airmen, and 7930.9 Notices to Airmen (NOTAM) Approved NOTAM Contractions."

A massive amount of information is available to aid in keeping us safe and in circumventing an unwanted letter from the nearest Flight Standards District Office (FSDO). In the "Graphic TFR" section, there is a list of each active TFR, the date it was posted, the facility that controls it, the state in which it resides, and a written description of the reason for the TFR.

The reasons can be an air show or sports events, VIP (normally held for the President, Vice-President, and visiting foreign dignitaries), security (national type), and hazards. The last one covers national disasters, local disasters such as Mount Saint Helen eruption, or any other location where rescue, aid, searching, or police/government patrolling/observation is on going.

The "Center NOTAMs" section has a selection box for TFR's and Special Notices. A search for information is divided by the various controlling Air Route Traffic Control Centers (ARTCC). By clicking on the desired area of flight and the controlling Center, you will discover the information and NOTAMs that are under the control of that Center. In the lower right hand corner of this page is a selection list for "View All ARTCC TFRs," "View All GPS NOTAMs," View All CARF NOTAMs," and "View All Special Notices."

Another page, under "Published Notices to Airmen" provides the electronic version of the printed "Notices To Airmen" that is produced every 28 days. It is a fast, easy, and current way to assure you have the most current information that is ready for review. It is accessible by Edition Date and Effective Date. When you click on a date, a page opens that has "Special Events in This Issue" that include "Sporting & Entertainment Events" as well as "Air Shows." On the right side of the page is listed "Contents In Every issue." If you are trying to plan your routing around TFRs, you can get more exact information from "Radius Search" or "Flight Path Search." Each will provide you the opportunity find TFRs along your path and aids to navigate around them.

The FAA provides a lot of information for our use. It is all designed to provide us with the information necessary to make a more informed decision for a safe and uneventful flight, allowing us to decide whether or not to take the flight.

Just as there are a variety of means and places to find weather information, there are also various locations to gather TFR information. The AOPA web site carries much of the same information as the FAA's web pages. Going into the AOPA web's home page we find a guide that will take us to several other pages that contain TFR information, questions about TFRs, and provides a relatively short quiz to help you understand TFRs and Special Use Air Space. For those on the East Coast there is an excellent information page on the Washington, DC ADIZ.

Another great place to discover information on TFRs comes from a location that is not the FAA's but still the United States Government. The Bureau of Land Management (BLM) has a web site < http://airspace.nifc.gov/mapping/nifc/index.cfm > that depicts TFR air space. It is shown graphically on an interactive United States map. All you have to do is click on the map that is on the home page and a larger map appears. At the bottom of the larger map a menu is available to select a plethora of information. Topic areas include "Stadiums," "Nuclear Sites," "Selected Airspace," "Airports," "Navaid," "Airway," "SUAS," Airspace," "Military Training," "Aerial Refueling," and "ARTCC Boundries." In addition to all that, you can get the information in relation to sectional and WAC charts.

And if that is not enough web sites to gather and select data from for TFRs, using a search engine for Temporary Flight Restricted areas, I discovered there are 430,000 sites that contain some information on this subject.

With all this data available, why would any of us deliberately place ourselves in a position to enter, nick, or even get close to a TFR? Sometimes we rely heavily on the on-board navigation equipment. The GPS has been touted as the best thing since sliced bread. It is very good and is a fantastic aid to navigation. But it is only an aid. It must be updated periodically and we must fully understand how it

works and how to make it work for us. We must have a means and manner to assure the data is correct, current, and viable. Normally, the currency date shown at the start-up of the equipment will provide that for us. As with all phases of flight, it is the pilot-In-command who has the final authority with the responsibility to start, proceed, and complete a flight safely. It is our navigation skills using the interpretation of the information received from our navigational equipment that will keep us from inadvertently penetrating a TFR. We cannot delegate that authority to an electronic piece of equipment.

Take the time to look at these and other web sites that provide information on TFRs and Special Use Air Space. You will be amazed at the overwhelming amount of data available as well as the exacting information at your fingertips! Enjoy your flying, stay safe, and stay up with the changes in our National Air Space System with those changeable TFRs!

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Al Peyus is an Aviation Safety Inspector with Flight Standards Service's General Aviation and Commercial Division.

HAZMAT CORNER

The Federal Aviation Administration, Office of Security and Hazardous Materials, Northwest Mountain Region, has noted an increasing trend in violations associated with the transportation of emergency and survival kits. These kits often contain signal flares, matches, lighters and other items which are considered to be hazardous materials. While these kits can be transported in general aviation aircraft as part of their airworthiness requirements, the kits cannot be transported in air commerce.

Although the hazardous items included in emergency and survival kits can be dangerous aboard any aircraft, they are specifically forbidden in checked or carry-on baggage aboard commercial airlines. Many General Aviation (GA) and commercial pilots unknowingly violate the Hazardous Materials Regulations (HMR's) by offering these kits (and the hazardous items therein) for transportation in their baggage when traveling on commercial aircraft. This occurs most often when pilots are repositioning a GA aircraft and are returning to their point of origin, or when flying commercially to pick up a GA aircraft.

Violations of the HMR may result in a civil penalty from a minimum of $250 to a maximum of $30,000 per violation. Title 49 Code of Federal Regulations, Part 175.10 provides exceptions for the transportation of hazardous materials in checked and carry-on baggage. Reviewing these exceptions and visiting our website at <http://ash.faa.gov/Hazmat.asp> is a good start in educating yourself on the safe transportation of hazardous materials. If you have further questions, please contact your nearest FAA Security and Hazardous Materials Office.

AIR TOUR UPDATE

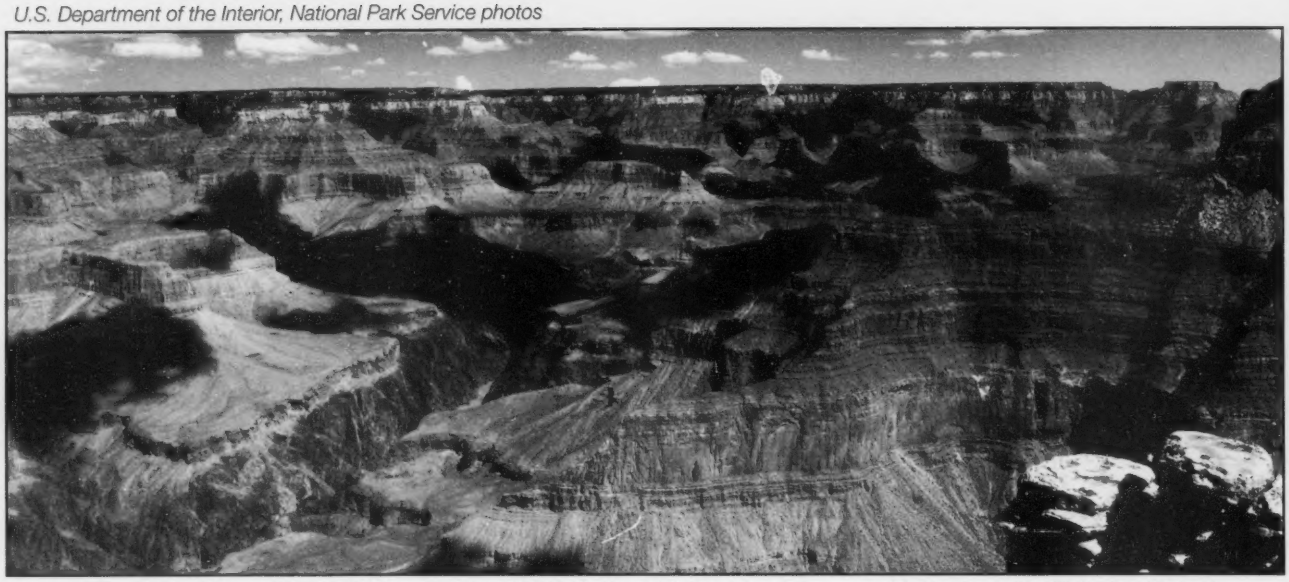
by Gene Kirkendall

The National Parks Air Tour Management Act of 2000 (the Act) was enacted by Public Law on April 5, 2000. On October 25, 2002, the Federal Aviation Administration (FAA) published in the *Federal Register* (67 FR 65662) a final rule [Title 14 Code of Federal Regulations (14 CFR) part 136, National Parks Air Tour Management] to fulfill a mandate of the Act. This final rule completed the definition of "commercial air tour operation" by establishing the altitude (5,000 feet above ground level) below which an operator flying over a national park for the purpose of sightseeing would be classified as a commercial air tour operator.

The rule also codified provisions of the Act. In accordance with 14 CFR section 136.7(b), before commencing commercial air tour operations over a unit of the National Park system or tribal lands within or abutting a national park, a commercial air tour operator is required to apply to the FAA Administrator for authority to conduct the operations over the park or tribal lands. Upon application, as per 14 CFR section 136.11(a), the Administrator shall grant interim operating authority (IOA), if an operator is an existing commercial air tour operator. Title 14 CFR section 136.11(b)(3) states that IOAs granted under that section would be published in the *Federal Register* to provide notice and opportunity for comment.

The FAA realizes that 14 CFR part 91 operators may not regularly read the *Federal Register*. Based on information received from multiple sources and its own internal review, the FAA believes there may be some errors in the number of commercial air tours initially reported, so FAA wanted to provide an opportunity for air tour operators to review and correct, if

U.S. Department of the Interior, National Park Service photos



necessary, their information. FAA is asking all commercial air tour operators to validate their information with the FAA. On January 27, 2005, the FAA published in the *Federal Register* (Volume 70, Number 17) a notice titled Notice of Opportunity To Self-Correct Annual Authorizations for Commercial Air Tour Operators Over National Parks and Tribal Lands Within or Abutting National Parks.

There are several reasons why errors could have unintentionally occurred, such as: (1) Operators were not required to keep records of the number of commercial air tours conducted over national parks prior to the adoption of the Act; (2) there was a two and a half year lapse between the passage of the Act and the effective date of the rule; and (3) there appears to have been confusion over how to report information, especially for operators flying over more than one park. With regard to the third reason, a number of operators reported operations for more than one park by stating the number of total flights and then listing the parks separately. This alone may have led to over-reporting the number of commercial air tours over national parks.

Thus, the FAA has issued individual letters to each operator in the FAA's Air Tour database notifying them that they should confirm and correct, if necessary, their allocation numbers for each park. If operators notice that the number of allocations granted over a park as shown in their operations specifications is incorrect, they should notify the FAA by letter or e-mail of the correct amount. Self-correcting letters may be sent to Gene Kirkendall, Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, or e-mailed to Gene.Kirkendall@faa.gov . There is no penalty for self-correcting. Any operator not receiving an individual letter from the FAA should confirm their commercial air tour interim operating authority allocations. Operators also should notify Kirkendall if they did not receive an individual letter. Operators not submitting a change will be deemed to have confirmed the number originally reported to the FAA and issued as IOAs.

When confirming status and the number of flights issued for each operator, operators should keep in mind the following guidelines:

(1) Only operators that conducted operations at any time during the 12-month period before April 5, 2000, (the date of enactment of the Act), qualify as existing operators. Only operators reporting to FAA as existing operators should have received an IOA. In situations where an operator has a question about its existing operator status, it should contact its local Flight Standards District Office (FSDO) regarding its status. The FAA has received several questions regarding corporations that qualified as existing air tour operators and then experienced a change in business management during the time lapse. Whether these operators qualify as existing operators will be decided on a case-by-case basis by the FAA.

(2) The number to be published in the *Federal Register* must reflect only the number of commercial air tour flights conducted by an operator over

a particular park within either (a) the 12-month period before April 5, 2000; or (b) the average number of flights per 12-month period for the 3-year period before April 5, 2000, and for seasonal operations, the number of flights so used during the season or seasons covered by that 12-month period. The number should not include desired increases above the allowed historical number of new entrant requests. Operators should not have received increases or new entrant authority through this IOA grant. Such requests will be handled through a separate process by FAA and the National Park Service.

(3) Operators should receive an IOA that reflects the actual number of commercial air tours that were conducted during the relevant time period set forth in the statute and the rule. Operators needing to self-correct should identify each park and the number of flights for each park, including whether the flight was part of a circuit, and if so, what parks were included in that circuit. For instance, operators flying over more than one park between takeoff and landing should identify those flights as circuit tours. Thus, if the operator flew over three parks during the same flight (takeoff to landing) in 100 flights, then the operator should specify this to the best of its ability. If the operator flew 100 flights with each flight going over one park of three different authorized parks, then the operator should so specify.

FAA will prepare a final listing of all existing commercial air tour operators receiving IOAs and the number of flights per park and publish the revised list in the *Federal Register* for comment, as required by the statute. If comments are received in response to that publication that provide substantive information that an operator does not qualify under the law as an existing operator or has erroneously reported the number of flights flown over a park, the FAA may investigate and take corrective action, if necessary, to bring the operator into compliance with the law.

Operators checking their records should keep any supporting information in their files in case questions arise that might result in an investigation. Operators may voluntarily provide such supporting information at this time to FAA, but they are not required to do so. Any commercial air tour operators that have not contacted the FAA should do so immediately.

The IOA information provided to the FAA will be used solely to determine and confirm the appropriate allocation for IOAs and will not be used to determine noise impacts to national park resources.

For more information, operators should contact Gene Kirkendall, Flight Standards Service, Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591. His telephone number is (202) 385-4510. His email address is Gene.Kirkendall@faa.gov.

Aviation Maintenance Alerts

THROTTLE CONTROL CABLE

The Associate Manager, Atlanta Aircraft Certification Office, ACE-115A, submitted the following article. (The article is published as it was received.)

The FAA investigation of a recent fatal accident of a reciprocating engine powered airplane revealed an improperly maintained engine control cable. The pilot of the airplane involved in the accident stated that while in cruise flight at 2,500 feet, the engine suddenly began to "sputter." The RPM was 700 to 800 and even though he moved the throttle in and out several times, the engine remained at 700 to 800 RPM; the throttle position made no difference. The pilot elected to make a forced landing on a highway but collided with trees and power lines. The airplane was destroyed by a post crash fire.

The subsequent investigation by the FAA and the NTSB revealed that the throttle cable had broken inside the sleeve and was not able to function. The airplane was several years old but the engine throttle cable had never been replaced. It could not be determined from the maintenance records when or if the throttle cable had been serviced, i.e. oiled.

The recommendations contained in this article are applicable to all reciprocating engine powered airplanes. Older airplanes are of a greater concern, but even new airplanes can be susceptible to similar types of failure if recommended maintenance is not performed. Proper operation and maintenance will mitigate the effects of mechanical and environmental induced wear and tear experienced during operation of the airplane and engine.

The FAA recommends that mechanics review the guidance contained in Advisory Circular (AC) 20-143 "Installation, Inspection and Maintenance of Controls for General Aviation Reciprocating Aircraft Engines" dated June 6, 2000. This AC provides guidelines for maintenance of engine control cables and linkages in general aviation airplanes. It is recommended that all maintenance technicians and inspectors become familiar with this document and use it to supplement data found in the airplane/engine maintenance manuals and service bulletins.

For further information contact: Jerry Robinette, Senior Propulsion Engineer, Propulsion & Services, Atlanta Aircraft Certification Office, ACO-CE118A-ATL, One Crown Center, Suite 450, 1895 Phoenix Blvd., Atlanta, GA 30349; telephone: (770) 703-6096; fax: (770) 703-6097.

Continental; TSIO 520R; Failed Exhaust Valve; ATA 8530

It was close to noon and 17,000 feet over Pueblo, Colorado, when this pilot experienced a loud backfire, severe vibration, and a loss of engine power. The Cessna T210 was IFR to Denton, Texas. "I immediately reduced power and the vibration stopped," writes the pilot. "I declared an emergency with Center and asked for the nearest suitable airport which had good weather. Colorado Springs, which was VFR, was offered and accepted." He reported having sufficient power to assist in a controlled descent to the airport where a safe landing was made. Maintenance found approximately forty percent of an exhaust valve head (P/N 637781) had given away, severely damaging cylinder number one. The broken valve piece was found in the intake tube, having previously contacted both the piston and cylinder head surfaces. No speculation as to cause of the valve's failure was provided. Part Total Time: (unknown).

Lycoming; O-320; Leaking Carburetor; ATA 7322

The mechanic describes this Cessna 172 as having leaked gasoline into the engine airbox and cowling for an unspecified period of time, but perhaps as much as 400 hours. At the inevitable point of inspection and teardown of the Marvel Schebler carburetor (model 4SPA), he found the simple omission of the float shaft cotter pin (P/N A82-11) as the offending culprit. He states: "...the log book records this carburetor to have been overhauled by Precision Airmotive and purchased from Aircraft Spruce & Specialty in June, 2004." Part Total Time: 400 hours.

Rolls-Royce; 250-C20; Grinding Noise; ATA 7200

The pilot of this Bell 206B helicopter "...reported hearing a grinding noise from the engine, followed by a chip detection light..." This event triggered a power-on precautionary landing. The aircraft was returned to service with another engine while its original was sent to Essential Turbines, Inc., of Canada for further evaluation. No speculation was offered with this report.

The following time summations were provided: aircraft total time as 16,572.2; engine total time as 9,341.0; engine cycles since new as 5,393; engine gearbox time since new as 9,341.0 and since overhaul as 9,341.0; engine compressor time since new as 9295.8 and since overhaul as 2914.8; compressor cycles since new as 20475 and since overhaul as 4355; engine turbine time since new 11466.5 and since overhaul as 1655.9; engine cycles since new as 22971 and since overhaul as 3707...hours. Part Total Time: (unknown).

Cessna; R182; Broken Rudder Pedal Bearing-Block Support; ATA 5311

A mechanic noticed an unusual "...feeling..." with the aircraft's rudder pedals during an engine ground-run for a 100-hour inspection. Close observation revealed broken web flanges (P/N 0713628-5 & -6) where nut plates are mounted for attachment of the rudder pedal's bearing-blocks. Part Total Time: 5,397.7 hours.

Piper; PA44-180; Cracked Aileron Skin; ATA 5751

An annual inspection found a crack (approximately centered) in an aileron's outboard skin (P/N 86562-06). The part was replaced. No analysis for the crack's occurrence was offered. *(This mechanic's report is one of three for similar cracks found in the same location on three different PA44-180 aircraft. Crack descriptions did not include dimensions or a top/bottom aileron reference. The three reported aircraft were all within 327 hours of their respective total times.)* Part Total Time: 7,707.7 hours.

Control Number	Aircraft Make	Engine Make	Component Make	Part Name	Part Condition
Difficulty Date	Aircraft Model	Engine Model	Component Model	Part Number	Part Location
2005FA0000034	BEECH	PWA		RELAY	FAILED 10/19/2004
	B200C	PT6A42		SM50D7	TE FLAPS

WHILE THE AIRCRAFT WAS IN FLIGHT, THE FLAPS FAILED TO EXTEND TO THE SELELCTED APPROACH POSITION. THE PILOT CYCLED THE FLAP SELECT SWITCH TO UP AND BACK TO APPROACH AND THE FLAPS EXTENDED. MAINTENANCE INVESTIGATED THE REPORTED PROBLEM AND WAS ABLE TO DUPLICATE THE PROBLEM ON THE GROUND. WHEN THE FLAPS WERE SELECTED TO APPROACH THE FLAPS MOVED APPROXIMATELY 5 DEGREES

2005FA0000026	CESSNA	CONT	CONTROL PANEL	WORN
1/13/2005	172	0300*		PITCH CONTROL

AIRCRAFT WAS SUBSTANTIALLY DAMAGED DURING A LANDING ACCIDENT. PILOT WAS UNABLE TO FLARE AIRPLANE. DURING A POST ACCIDENT INSPECTION BY FAA INSPECTORS, IT WAS DISCOVERED THAT THE AIRPLANE'S CONTROL TEE PULLEYS FOR THE AILERON SYSTEM WOULD GET (HUNG UP) ON THE RADIO TRAY ASSEMBLY, WHEN THE CONTROL WHEEL TUBE WOULD REACH HALF TRAVEL. THE CONTROL TEE PIVOT AND THE LEFT INSTRUMENT PANEL CONTROL TUBE BALL SOCKET, EXHIBITED WEAR, AND THE CONTROL TEE COULD BE MOVED LATERALLY ALONG A PORTION OF THE CONTROL TEE PIVOT BOLT. ADDITIONALLY, THE RADIO-MOUNTING TRAY DID NOT INCLUDE THE INSTALLATION OF A VERTICAL SUPPORT TO HELP ASSURE PROPER CLEARANCE BETWEEN THE TRAY AND THE CONTROL TEE ASSEMBLY.

2201092004	CIRRUS	CONT	CIRRUS	BOLT	CHAFED
10/4/2004	SR22	!0550N		AN334	INDUCTION DUCT

DURING REMOVAL AND REPLACEMENT OF THE P/N 15708-001 INDUCTION DUCT ASSY IT WAS NOTED THAT DUCT WAS CRACKED IN THE AREA OF THE AN3-34 BOLT THAT SERVES AS THE HINGE POINT FOR THE ALTERNATE AIR DOOR. AFTER REMOVING THE BOLT IT WAS FOUND TO BE CHAFFED ALL THE WAY AROUND THE SHANK (360 DEGREES). IT APPEARS THE INDUCTION DUCT SUPPORT BRACKET P/N 15671-002, MADE OF STAINLESS STEEL, IS WEARING ITS WAY INTO THE BOLT SHANK. SEVERAL OTHER AIRCRAFT WERE INSPECTED AND WERE FOUND TO HAVE BOLT WEAR AND/OR CRACKING OF THE DUCT IN THE SAME AREA. THE CRACKING OF THE DUCT IS VERY DIFFICULT TO SEE WITHOUT REMOVING THE ASSY AND THE CHAFFING OF THE BOLT CANNOT BE SEEN WITHOUT REMOVING IT.

The Aviation Maintenance Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those who operate and maintain civil aeronautical products and can be found on the Web at <http://www.faa.gov/avr/afs>. Click on "Maintenance Alerts" under Regulations and Guidance. The monthly contents include items that have been reported as significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts' readers prompt notice of conditions reported via Malfunction or Defect Reports, Service Difficulty Reports, and Maintenance Difficulty Reports. Your comments and suggestions for improvement are always welcome. Send to: FAA; ATTN: Aviation Data Systems Branch (AFS-620); P.O. Box 25082; Oklahoma City, OK 73125-5029.

• Sideslip vs. Forward Slip

As usual, I enjoyed reading the excellent articles that appear in the bimonthly publication of *FAA Aviation News*. However, in the January/February issue I feel compelled to point out an error made by the author in the article, "Going Solo." Perhaps only a Freudian slip, but nevertheless one that demands clarification, if only for the enlightenment of the practicing flight instructor.

The author should be commended for his suggestions on how to better equip a pilot for his or her first flight in a single-seat aircraft. However, on page 17, center column titled "First Flights," second paragraph, I suggest the author meant to say "sideslip," not "forward slip." There is a significant difference between the two and when they should or should not be used.

The forward slip is used to rapidly dissipate altitude when a pilot finds him- or herself too high on the final approach segment of the landing exercise. This results in an increased rate of descent without an undesirable increase in airspeed. It is not, and should not, be used to correct for a crosswind during the later part of the landing exercise. It is the sideslip that comes into play during the final landing segment to counter any crosswind.

Unlike the forward slip, the sideslip provides that the longitudinal axis of the aircraft remains parallel with the runway, which is essential when the aircraft makes contact with the runway. This is accomplished by lowering the wing into the wind and applying appropriate and opposite rudder pressure to counter any resultant turning tendency. This maintains the aircraft in a proper configuration for the actual contact with the runway.

A detailed explanation of slips can be found on page 8-10 in the FAA's *Airplane Flying Handbook*, FAA-H-8083-3A, dated 2004.

Myron W. Collier
McMurray, PA

FAA Aviation News *would like to thank you and the other readers who sent in comments. Your letter says it all.*

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to H. Dean Chamberlain, Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address:

Dean.Chamberlain@faa.gov

• CFI Expiration Dates

I renewed my CFI certificate in June 2003. In September 2003, I applied for one of those "credit card" style certificates. I just noticed that my CFI certificate has a June 2005 expiration date. Shouldn't it expire in September 2005?

Name withheld by request

You applied for a replacement *of your paper flight instructor's certificate with the plastic certificate. Therefore, you would retain your original expiration date of June 2005. You will get a new expiration date when you* renew *your flight instructor's certificate in accordance with Title 14 Code of Federal Regulations §61.197.*

• Lights and the FAA

Recently I saw an energy saving exhibit in the lobby of the FAA's building in Washington. One of the item on display was a red warning light for marking obstacles. Is the FAA planning on using such lights?

Name withheld by request.

Yes, the light you saw was a new, energy saving light emitting diode (LED) obstruction light. It is designed to replace the current obstruction lights used by the FAA throughout the National Airspace (NAS) to mark any obstacle that may be a hazard to flight. According to the FAA office responsible for such lights, the new LED lights are a money saver.

In the data provided, it said there are about 20,000 L-810 red obstruction lights used in the NAS. The traditional incandescent steady state version uses about 116 watts per light or about 557.96 kilowatt-hours (kWh) per year. The projected cost for this type of light over a 10-year period, which includes bulb cost, installation, and operating costs, is about $1,500. Now compare this cost to the new LED version with its energy consumption of 12.5 watts per light. Although the new LED bulb costs significantly more than the traditional incandescent bulb, the projected 10-year cost for the new LED is only about $266. This equates into a significant savings for FAA.

These projected savings are based upon the cost of electricity at $0.10/kWh, the lights operating 4,810 hours each year, and the cost to change a bulb is about $100. The new LED bulbs long life and the savings of not having to replace them very often contribute to the total system savings. An engineering report noted that the problem with replacing obstruction lights is that they very often are located in very difficult places to reach such as on top of high towers and other inaccessible places.

AVIATION ACCIDENTS DECREASED IN 2004

The National Transportation Safety Board has released preliminary aviation accident statistics for 2004 showing a decrease in several civil aviation categories, including scheduled airliners, air taxis, and general aviation operations.

The total number of U.S. civil aviation accidents decreased from 1,864 in 2003 to 1,715 in 2004. Total fatalities also showed a decrease from 695 to 635. The majority of these fatalities occurred in general aviation and air taxi operations.

General aviation accidents decreased from 1,741 in 2003 to 1,614 in 2004. There were 312 fatal general aviation accidents, down from 352 the year before. The accident rate decreased from 6.77 per 100,000 flight hours in 2003 to 6.22 in 2004. The fatal accident rate decreased from 1.37 to 1.20.

Last year, one fatal accident occurred involving Part 121 airline service. A Jetstream 32 twin-engine airplane operated by Corporate Airlines, doing business as American Connection, crashed on instrument approach to Kirksville Regional Airport, Kirksville, Missouri. The accident resulted in 13 fatalities.

Air taxi operations reported 68 accidents in 2004, a decrease from 75 in 2003. The accident rate also decreased from 2.56 per 100,000 flight hours in 2003 to 2.21 in 2004. However, fatalities increased from 42 in 2003 to 65 in 2004.

Tables 1-12 providing additional statistics are available at <http://www.ntsb.gov/aviation/Stats.htm>.

SPECIAL NOTICE ABOUT DC ADIZ

A new warning signal for communicating with aircraft is being deployed within the Washington D.C. metropolitan area Air Defense Identification Zone (DC ADIZ,) including the Flight Restricted Zone (FRZ.) The anticipated operational date is May 21, 2005. The signal consists of highly focused red and green colored lights in an alternating red/ red/green signal pattern. This signal may be directed at specific aircraft suspected of making unauthorized entry into the ADIZ/FRZ and are on a heading or flight path that may be interpreted as a threat or that operate contrary to the operating rules for the ADIZ/FRZ.

The beam is not injurious to the eyes of pilots/aircrews or passengers, regardless of altitude or distance from the source. If you are in communication with Air Traffic Control (ATC) and this signal is directed at your aircraft, we advise you to immediately communicate with ATC that you are being illuminated by a visual warning signal. If this signal is directed at you and you are not communicating with ATC, we advise you to turn to a heading away from the center of the FRZ/ADIZ as soon as possible and immediately contact ATC on an appropriate frequency, or if unsure of the frequency, contact ATC on VHF guard 121.5 or UHF guard 243.0.

Be advised that failure to follow the recommended procedures outlined above may result in interception by military aircraft and/or the use of force. This notice applies to all aircraft operating within the ADIZ, including Department of Defense, law enforcement, and aeromedical operations. This notice does not change procedures established for reporting unauthorized laser illumination as published in Advisory Circular 70-2.

QRS 11 QUARTZ ANGULAR RATE SENSORS EXPORT REGS

A major dilemma has arisen concerning export of certain electronic devices that may be installed on aircraft being presented for export. The QRS 11 Quartz Angular Rate Sensor is an electro-mechanical sensor gyro that is fabricated from crystalline quartz into a monolithic Coriolis-based angular rate sensor. After extensive review and analysis, the Department of State has determined that the QRS 11 family of quartz angular rate sensors remain subject to the export-licensing jurisdiction of the Department of State in accordance with the International Traffic in Arms Regulations.

Certain QRS 11 quartz angular rate sensors are integrated into and included as an integral part of a commercial standby instrument system for use on civil aircraft or exported solely for integration into a commercial standby instrument system. New aircraft being produced today, with what is commonly referred to as "glass cockpits," may contain instruments with QRS 11 angular rate sensors as a subcomponent. Without the appropriate authorization, aircraft and components that contain these sensors are not eligible for export. The dilemma arises when aircraft are presented for export and neither the exporter nor the FAA/Designee is aware that a subcomponent of a navigation or gyro system contains the QRS 11 sensor.

There is no current FAA policy available to refer a designee or an inspector to the Office of Foreign Assets Control nor the Bureau of Industry and Security web sites to research this problem or any other problem concerning export of products that may be considered defense articles. With the state of world affairs today, the export of products and components containing these sensors could possibly lead to arrest and prosecution based on the International Traffic in Arms Regulations of the Department of State.

For more information, see the April 2005 issue of the Designee Updates at <http://afs600.faa.gov/srchFolder.asp?Category=DesigneeUpdate>.

NTSB OFFERS MULTI-LINGUAL INFORMATION

In an effort to better serve the public, the National Transportation Safety Board's web site now provides French and Spanish language information about the Safety Board, as well as information about the Board's products and services.

The multi-lingual information is part of the Safety Board's response to the President's Management Agenda for electronic government— e-government. The e-government initiative is designed to make better use of information technology (IT) investments in order to improve government services to citizens. French and Spanish language information currently available on the web site includes the history and mission of the Safety Board, details about the Board's investigative process, information on the Federal Family Assistance Plan for Aviation Disasters, detailed descriptions of the Board's products and services, and contact information for NTSB Headquarters and regional offices.

Information can be accessed through a link on the NTSB's homepage, <http://www.ntsb.gov>.

FAA EXTENDS ELIGIBILITY OF COLLEGE CONTROLLER PROGRAM GRADUATES

The FAA will extend the eligibility period for college students with training in air traffic control. The change in policy for graduates of the FAA's Air Traffic Collegiate Training Initiative (AT-CTI) is expected to give the agency more flexibility in reaching controller candidates as it prepares to hire and train 12,500 air traffic controllers over the next 10 years. The hirings are intended to offset the expected wave of controller retirements.

Traditionally, the FAA has hired controllers from several sources, including AT-CTI programs that teach air traffic control. However, under long-standing FAA policy, these graduates could be hired on an expedited basis only within two years after graduation. The FAA's new policy allows them to apply for a one-year extension of hiring eligibility each year until they turn 31, the maximum hiring age for controllers.

"We want to leave the door open as long as possible," said FAA Administrator Marion C. Blakey. "By extending the hiring period, we can tap a valuable source of potential new controllers and be fair to those who have already invested in their aviation careers."

The FAA now has agreements with 13 colleges and universities to offer courses in air traffic control. Graduates of these schools are a primary source of new FAA controllers. The list of these schools is at http://www.faa.gov/careers/employment/AT-CTI-MAP.htm. Additional information about becoming an air traffic controller is at <www.faa.gov/jobs>.

NTSB PUBLISHES JOURNAL OF ACCIDENT INVESTIGATION

The National Transportation Safety Board (NTSB) has published its first issue of the *Journal of Accident Investigation*. This is a biannual publication to promote transportation safety through science, and is affiliated with the NTSB Academy in Ashburn, Virginia.

The Safety Board's objective for the *Journal* is to provide the public an exchange of ideas and information developed through NTSB's accident investigations in all modes of transportation. It will contain published research and technical articles on accident investigations that may be of interest to professionals in safety, accident investigation, engineering and the behavioral sciences.

The *Journal* will also include short reports of major developments, news, events, research efforts, and announcements of upcoming courses, forums, symposiums and public hearings conducted by NTSB.

In the first issue, the featured articles include:

- "Combating Hardcore Drunk Driving" by Susan Molinari, Chairman of the Century Council.
- "Fighting Fatigue" by Representative James L. Oberstar of Minnesota, Ranking Democratic Member, House Committee on Transportation and Infrastructure.
- "Safety and Security" by Representative Don Young of Alaska, Chairman, House Committee on Transportation and Infrastructure.
- "Information Management in Aviation Accident Investigations" by Dana Schulze, Jana Price, National Transportation Safety Board, and Tina Panontin, National Aeronautics and Space Administration.
- "Impact Resistance of Steel from Derailed Tank Cars in Minot, North Dakota" by Frank Zakar, National Transportation Safety Board.
- "Air Cargo Safety Forum" by Joseph M. Sedor, National Transportation Safety Board.

Copies of the *Journal* are available on the NTSB web site at <http://www.ntsb.gov/publictn/2005/JRN0501.htm>.

Mustang's First Flight

Cessna Aircraft Company announced that its new *Citation Mustang* prototype successfully completed its first flight in Wichita, Kansas on April 23. The entry-level, single-pilot business jet flew for 141 minutes. During the flight that included going to 11,000 feet, the aircraft's stability, controls, landing gear, flaps, and speed brakes were tested. According to Cessna, the aircraft's expected cruise speed is 340 knots with a maximum operating altitude of 41,000 feet.

Editor's Runway

from the pen of K. Dean Chamberlain

It is official. The major air show season has begun. The annual Sun 'n Fun Fly-In in Lakeland, Florida, traditionally marks the beginning of the season. If first impressions are as important as everyone says they are, then this is the year of glass. Glass cockpits seemed to be in every aircraft except those aircraft too small to install the glass panels in. But then, many of those small aircraft were themselves made of glass, fiberglass or high-tech composite materials. From the traditional four-place family aircraft up through business jets, today's buyers can order their new aircraft with multicolor glass panel displays instead of the traditional round gauges. The only round gauges to be found in many of the aircraft models on display were the backup, emergency instruments. Most of the major manufacturers had one or more glass cockpit aircraft on display. The era of glass has arrived.

Not only have the traditional general aviation (GA) aircraft manufacturers gone to glass cockpits, so have the after-market electronic companies. I thought two of the hottest add-on items being sold and shown at the fly-in were the various in-flight weather systems being demonstrated at the show as well as the various terrain avoidance systems. Designed for use with either built-in glass cockpit display panels or small, handheld displays such as personal digital assistants (PDA), weather and terrain charting offer your average GA pilots many of the benefits that were once found only in top of the line corporate aircraft. For a monthly fee, pilots can now see almost real-time weather radar images beamed to them from satellites without the need to have onboard radar. For those pilots whose only weather avoidance system were their own eyes and maybe an onboard lightning detector system in their small GA aircraft, now they can see the big picture without the cost of expensive onboard radar. Add in the newest terrain awareness systems that use GPS positioning information and a corresponding terrain database to show your surrounding terrain and you can begin to see the future of general aviation safety. Since weather and controlled flight into terrain are major killers, the future looks bright for the new products. Now, the challenge for many pilots will be which system to buy.

Not only will pilots have to make choices about cockpit layouts, weather systems, and types of terrain avoidance systems to buy, but now they have two new light-sport aircraft to select from. Two new light-sport aircraft received FAA airworthiness certificates at Sun 'n Fun. The Flight Design CT and Evektor *Sportstar* can now be purchased ready to fly from their respective manufacturers and importers. These are the first two new light-sport aircraft recognized by the FAA using the new consensus standards developed by industry and FAA over the past two years. This cooperative effort between industry and FAA was a direct result of the Sport Pilot rule enacted by FAA last year.

Based upon the number and types of light-sport eligible aircraft being flown at Sun 'n Fun, the future of light-sport aircraft seems only limited by the imaginations of the various manufacturers. From the ultralight-vehicle like two-place aircraft to the various experimental-type aircraft that meet the light-sport aircraft definition to the new light-sport aircraft being developed to the older, traditional GA aircraft that meet the rule, I think the light-sport arena is one of the fastest growing segments in aviation.

Because the Sport Pilot rule was only published last year and the rule is still being implemented, as I walked around Sun 'n Fun, I heard people discussing the new rule. Although all were very enthusiastic about the rule, there were a few pilots who were repeating erroneous information about the rule. To avoid repeating erroneous information, pilots should review the complete rule and read the Sport Pilot column on page 21 in this magazine for more information. Written by the FAA's new Light Sport Aviation Branch (AFS 610) in Oklahoma City, the column contains the latest information available on the rule. Specific questions about the rule should be sent to the Branch at the email or address listed in the column.

Attending a major air show supported by industry provides everyone an opportunity to watch some of the best air show pilots in the world perform. However, for those who fly, maintain, or build aircraft, a major show, such as Sun 'n Fun, provides even more than an opportunity to watch an air show. It is an opportunity to learn. I think the many educational forums presented by industry or the FAA and the many hands-on workshops conducted by subject matter experts are worth more than the price of admission. We at FAA hope you have a great air show and fly-in season. And if you fly to the event, please remember to file a flight plan.

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